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<151> 2000-04-18

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atc 34203

<210> 3  
<211> 17  
<212> DNA  
<213> Artificial Sequence

<220>  
<221> misc\_feature  
<223> Description of Artificial Sequence: A mixed primer  
which has a DNA sequence deduced from the amino  
acid sequence of PKS of *A. fumigatus*.

<220>  
<221> modified\_base  
<222> (6)..(6)  
<223> i

<220>

<221> modified\_base  
<222> (9)..(9)  
<223> i

<400> 3  
gayacngcnt gyasttc

17

<210> 4  
<211> 17  
<212> DNA  
<213> Artificial Sequence

<220>  
<221> misc\_feature  
<223> Description of Artificial Sequence: A mixed primer  
which has a DNA sequence deduced from the amino  
acid sequence of PKS of Aspergillus flavus.

<220>  
<221> modified\_base  
<222> (3)..(3)  
<223> i

<220>  
<221> modified\_base  
<222> (6)..(6)  
<223> i

<220>  
<221> modified\_base  
<222> (8)..(8)

<223> i

<220>

<221> modified\_base

<222> (15)..(15)

<223> i

<400> 4

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17

<210> 5

<211> 19

<212> DNA

<213> Penicillium citrinum

<400> 5

gcatgttcaa tttgctctc

19

<210> 6

<211> 19

<212> DNA

<213> Penicillium citrinum

<400> 6

ctggatcaga cttttctgc

19

<210> 7

<211> 18

<212> DNA

<213> Penicillium citrinum

<400> 7  
gtcgcagtag catggccc 18

<210> 8  
<211> 20  
<212> DNA  
<213> *Penicillium citrinum*

<400> 8  
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<210> 9  
<211> 20  
<212> DNA  
<213> *Penicillium citrinum*

<400> 9  
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<210> 10  
<211> 19  
<212> DNA  
<213> *Penicillium citrinum*

<400> 10  
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<210> 11  
<211> 20  
<212> DNA  
<213> *Penicillium citrinum*

<400> 11  
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<210> 12  
<211> 19  
<212> DNA  
<213> *Penicillium citrinum*

<400> 12  
ctcccccagta cgtaagctc 19

<210> 13  
<211> 21  
<212> DNA  
<213> *Penicillium citrinum*

<400> 13  
ccataatgag tgtgactgtt c 21

<210> 14  
<211> 19  
<212> DNA  
<213> *Penicillium citrinum*

<400> 14  
gaacatctgc atcccccgtc 19

<210> 15  
<211> 20  
<212> DNA  
<213> *Penicillium citrinum*

<400> 15

ggaaggcaaa gaaaagtgtac

20

<210> 16

<211> 21

<212> DNA

<213> Penicillium citrinum

<400> 16

agattcattg ctgttggcat c

21

<210> 17

<211> 722

<212> DNA

<213> Penicillium citrinum

<400> 17

ggccacgcgt cgactagtagtac gggggggggg gggggggggg gcttgcgc tcagagattc 60

aactctgcga ttctgttaa tcccaatcct atcgcccaa aacaggatca gcagttatgg 120

atcaagccaa ctatccaaac gagccaattt tggttagtgaa aagcggttgtt cggttccag 180

gtgggtcaa cacaccatca aaactttggg agctgctaa agagccccgg gatgtacaga 240

ccaagatccc taaggagaga ttgcacgtcg atacattttt cagccccgat ggcactcacc 300

ccgggcgcac gaacgcaccc ttgcatact tgctgcagga ggatctacgc gtttttgatg 360

cctttttt caacatccaa gctggagagg ccgaaacgat tgacccacag caaaggctgc 420

tgctggagac ggtctatgaa gctgttatcca acgcaggcct acggatccaa ggccttcaag 480

gatcctctac tgctgtgtac gtcggatgaa tgacgcatac ctatgagact atcgtgacgc 540

gtgaattgga tagtattcct acatactctg ccacgggggt agctgtcagt gtggcctcca 600  
accgtgtatc atacttcttc gactggcatg ggccgagttt gacgatcgac acagcctgta 660  
gttcatcctt agctgccgtg catctggccg tccaaacagct tagaacggc gagagtacca 720  
tg 722

<210> 18  
<211> 760  
<212> DNA  
<213> *Penicillium citrinum*

<400> 18  
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ccagggcgac tgatatatca gtcaatgaaa caacgttggaa atgaacaata ccccccgcgt 120  
aaccgcaacc gcaaccgcaa ccgcaaccgc aaccgcaatg gcaggctcg cttgctctaa 180  
cacatccacg cccattgcca tagttggaat eggatgtcga tttgtggag atgcaacgag 240  
tccacagaag ctttggaaa tggttggaaag aggaggcagt gcctggtcta aggtccccctc 300  
ctcgcgattc aatgtgagag gagtatacca cccgaatggc gaaagggtcg ggtccaccca 360  
cgtaaagggt ggacacttca tcgacgagga tcctgcttta ttgacgcccgg cgttcttcaa 420  
catgaccaca gaggtcgcca gctgcatgga tccgcgttat cggcttgc ttgagggtgg 480  
ctacgaatcg ctggagagtgcggtatcac catcgatggat atggcaggct ctaatacgtc 540  
ggtgtttggg ggtgtcatgt accacgacta tcaggatcg ctcaatcggtt accccgagac 600

agttccgcgt tattcataa ctggcaactc aggaacaatg ctttgcacc ggatatcaca 660  
cttctacgac ttacgtggtc ccagcgtagac ggttgacacg gcctgtcgac cgacattgac 720  
cgcaactgcac ttggcggtgcc agagcttacg tactggggag 760

<210> 19  
<211> 773  
<212> DNA  
<213> Penicillium citrinum

<400> 19  
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cagcgctctc attcttcgt cttctttttt ttccactgggt gtgcataagggt cctatctgtc 180  
tcacgcaatg ctggccagg ttcttctgac cgtcgaatcg taccaatggg tatcgacccc 240  
tcaagccctt gtggcggtcg cagtgcgtt tagtctcatc gcctaccgtt tgccggggcgc 300  
ccagtcgaaa ctgcaagtct ataatccaa aaaatggtg gagttgacga ccatgagggc 360  
taggcaggac ttgcatacgat atggccgag ctggatcgaa gcttggttct cggaaaaacga 420  
caagccccctg cgccatcgatg ttgattccgg ctattgcacc atcctccat cgtccatggc 480  
cgacgagttt cgaaaaatca aagatatgtg catgtacaag ttttggcgg atgactttca 540  
ctctcatctc cctggattcg acgggttcaa ggaaatctgc caggatgcac atcttgtcaa 600  
caaagtgtt ttgaaccagt tacaaaccca agcccccaag tacacaaagc cattggctac 660  
cttggccgac gctactattg ccaagttgtt cggtaaaagc gaggagtgcc aaaccgcacc 720

tgtctattcc aatggattgg accttgcac acgaacagtc acactcatta tgg 773

<210> 20

<211> 527

<212> DNA

<213> Penicillium citrinum

<400> 20

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aacccttgg gccgaacaac cttcctccaa tctacgacgg cagattatac cttaggcgcct 120

aaccgattag gttgttcatt cgattttggg gagactacct agctataggt accactccaa 180

gctgttagcac agaccttca gcatggtcgc ttctgttgc ta ccctctcgct ttgcggtag 240

ggaatcaatg aatcagcagc accctctacg ctcggaaat cgggcatiga cctccacact 300

ccaatttcta tccaaaacgg cgtgtctaca cccgatccat accgttgca ccatagctat 360

tcttagctgtt accacatacg ttggactact caaagacagc ttcttcatg gccccgcaaa 420

cgttgataaa gcagaatggg gctcttttgtt cgaaggaagt cgaagcttga tcaccggccc 480

acagaatggc tggaagtggc agagcttcga cggggatgca gatgttc 527

<210> 21

<211> 522

<212> DNA

<213> Penicillium citrinum

<400> 21

ggccacgcgt cgactagtac gggggggggg gggggggggg ggatccatca atctgacttc 60

aggctagcgg accttaacga aacaacgaga gcgagatcat tcatacacca aaacacaggt	120
actatagaag cgccgcgcag tagagattca caccgcctt tgaagcaaaa gtcggaagga	180
attgcgcgat gtcagaacct ctaccccta aagaagggga accaaggcca cagaaggaag	240
aaagtcaaaa tgacacgctc gaagcgactg agtccaagtc ccagcacatc acaggcctca	300
agctcggtt ggtggttgct tcagttactt tcgttagcatt tttgtatgctc ctttatgt	360
ccattatcgta caccatcgta caagcgatcc ccactcttg aacgatgttag	420
ggtgtacgg cagtgcattt cttctggcta actgtgcctt ccagccctg gccgtaaat	480
tgtatacact cttggcttg aagtacactt tctttgcctt cc	522

<210> 22  
<211> 541  
<212> DNA  
<213> *Penicillium citrinum*

<400> 22	
ggccacgcgt cgacttagtac ggggggggggg ggctcacctc acattattttgc atcttaatcc	60
aataattatg tccctgccgc atgcaacgat tccgacgaac ctacggcgtc ggcgtttcg	120
acgctcatgt gaccgggtgtc atgcacaaaaa gctcaaatgt accggtagca atgccaattt	180
agtccgtgct cagtgtcaac gtgtcagca agccggatata aggtgtgtgt acagcgaaag	240
gctacccaag cgcaattttac ataaagaagc cgccagctgga actacaagag ccacagaaac	300
ctcacaaccg atgaccgcga catcttctac ggtcttcata tcattggcag agactcctcc	360

accttactgc tcaccaccta cgcatattgg cacctcgca ctcaaggaaa cattatcaga 420  
accatcagcg gcaaccctgc aattcttatga tacatcaatc aactttgatg atcccgagtc 480  
gtttcccgcc ggctggcctc agccaaatac atttcgcgac gatgccaaca gcaatgaatc 540  
t 541

<210> 23  
<211> 20  
<212> DNA  
<213> *Penicillium citrinum*

<400> 23  
atcataccat cttaacaac 20

<210> 24  
<211> 20  
<212> DNA  
<213> *Penicillium citrinum*

<400> 24  
gctagaatag gttacaagcc 20

<210> 25  
<211> 20  
<212> DNA  
<213> *Penicillium citrinum*

<400> 25  
acattgccag gcacccagac 20

<210> 26  
<211> 20  
<212> DNA  
<213> *Penicillium citrinum*

<400> 26  
caacgcccaa gctgccaaatc

20

<210> 27  
<211> 20  
<212> DNA  
<213> *Penicillium citrinum*

<400> 27  
gtctttcct actatctacc

20

<210> 28  
<211> 20  
<212> DNA  
<213> *Penicillium citrinum*

<400> 28  
ctttcccagc tgctactatc

20

<210> 29  
<211> 1524  
<212> DNA  
<213> *Penicillium citrinum*

<400> 29  
aactggaga attcgccggcc gcaggaattt tttttttttt ttttttcaa cgaaggtaga

60

agtaattttg acaaagatac aagacgaatt cgctatttgt agatgaatat gcgtgtgtca

120

attgaagccg aattcaggat agatttgcca tctgcttat tgccaaatttc taatccatct 180  
ttatcatgaa caacactcaa accacacatc tgaattcacg ggcgtgaacg atctaggcca 240  
acttcagagc cgggttcatc gagaacatag tgaggattga agaaaagggg tctacaaagg 300  
cctgagcgtg ctcagggcca tacagcgagc tctgaagttt gacatgaatg agtgggtcct 360  
tggtagggtc atcccacatc tcgagaacga tgtcataagg agtgcgccta cgggaagcga 420  
gaacactcgt catttggca ttgccaattt agccactctc cgcttgaccc tgcttgtaat 480  
caaagacagc ctggaacaag ggggcgtgtg tctgagtctt gggttccctcg cctgaggtag 540  
ggagattcag gcctagacag tcgaggatga cgccatacgg caccgcgcg tttgcattgg 600  
cctcacgcac actgtccctt gtggctacaa ggtgctcgcc gaatgtcttgc tgcgcacga 660  
actcatcaaa ggcgcagggga agcacgttag cgaaaaagcc catgccgaa atttcttcca 720  
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ccaacaaaac gtggtaggcg gccaggtaga actgcattttt ggttgccttgc tgcttgccgc 840  
tccgctttt gattcgaaag ggcgaccatgg gatctaaacg agcaattgtc tcatactgtc 900  
gccacgtgaa tggctgtatt tgctgtgtc ctgaatttgc agcagggtca ttgtcatcgat 960  
tcatgtatggg aagcacggtt ggcgcagatg acgagacttt gctatgcattt gacttccaga 1020  
acgcgatatic gtccccattt cgcattttt ccaggtttc ccgcgttgttgg acggctagat 1080  
cagagaattt ggtcgatggt cgctgcattt tcaccccgct gtaaatctgc ccgatctcat 1140  
tgaacaggtt ttctgtgtt gagccatcac caactaatct gtggtagccg attaccaaca 1200

ggtgttcatc tgtccccag tagaaatcaa cgagtctgag agtgcacct gtggagatgc 1260  
tatagtttgt cttctcgagt ttccggtaact ctccctctgc ctccgcagcg ttgtcacct 1320  
gaacaaagtg cactctgttc tccgggttct tggagaaccac ttggacggga ccatttaat 1380  
cgctgctata gtcatcgcca gtaacaaagc acgtacggaa gatctcgta cggcgcaatg 1440  
aggctttcag agccgcctc aaccggtcga ggtcaatggt acccttcatg aacatgccaa 1500  
tagtgttgtt gaagatggta tgat 1524

<210> 30  
<211> 784  
<212> DNA  
<213> *Penicillium citrinum*

<400> 30  
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ctcagggccca ctgtaatggt atttcaggta tctctatTTTtta ctgctatcca gaagtcaggc 120  
attaaatagt caggctcagc ccaggctcga tttagatgg attcaggctt cagaccatgg 180  
ccgctatgct cttcgtaact atacccgt cgagctatac ccgttggcc agacaaaagg 240  
cttcactgaa ccctcaact taactgcatt tcggccacaac taactcgacg aggccggcga 300  
tggtgttacc attcatgagc tcaaagatcg acacatcaac atggattca gatgtgatcc 360  
agtttcgaag ttcaatggcg acgagtgagt ctacggcgc acctggcagg ttttggacg 420  
aggacatgtc gtttctgccc agaccaaaca ttcgcatacg ctttccgtc attgctttga 480

ggacgataga aatggcctcg tcgtgagagg tgaccctgct tagttggcc cgcacgccat 540  
ctggtccttt tttatgcgaa gagacaaagg attggtctgc atgaaggact tggcggtatt 600  
taagtcccac aaaccgcigt tcctgtatcc agttgcctc ggtccagtga gcacccgggg 660  
atgtgttgat tcctgtaacc acagctgcgg gaggtgatgg aaattgaggg gaagaacaca 720  
ggattgcctt ctccaacaca tccatgacgt cctttcatg cataggcttgc taacctattc 780  
tagc 784

<210> 31  
<211> 764  
<212> DNA  
<213> Penicillium citrinum

<400> 31  
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cgaaaaattt tactaaccta ctcgactaat acagcaccta gtttctctgg gacggaaacc 120  
attgaaataa gcctggggac ggatgcataat ttgttttagt ttgcgtgtta tatcttagca 180  
ccggtcatga gggagcggga tgcctcggtt ggcggcgtt accatgagct ttgtggttgg 240  
atgcatacga acgctaaaag cgtgacggta gtatttgca tcgtctctgg gtacaggctt 300  
cacatcatac tgaatcagta tatgagcggag gagaatcttgc atttccttcg aggcaagaa 360  
ccggccggga caagcgcgtg ggttccagcc gaagccgatg tgatcaccgt tggattctc 420  
caattgagcg gtgaaggcct tgcgtggatc ctcgcgcattt cgccataaattt ggttagggatc 480  
ataatttcg gggtttcccc acacatcagg gttgttcatg cggctgcag ccacagcggc 540

caactcgccc ttgggaatga agaggccatt ggatagagt atgtctctga gagcggta 600  
ggcatacgat ggcactcgat ccggcttgcat tcgctgcgtc tcttcatgc agctgtcgag 660  
gagcttcagc ttgaacagag aggccaggcg 720  
ccagccccct tctccgatta cagtgcggat  
ctcttgcgg agaggctgaa taaggtctgg gtgcctggca atgt 764

<210> 32  
<211> 765  
<212> DNA  
<213> *Penicillium citrinum*

<400> 32  
aactggaaga attcgccggcc gcaggaattt tttttttttt tttttctgg aaaaggacca 60  
tctcttata tattcttctt ccctactact tgcatcgtaa atttcaacaa catataaaca 120  
tgagataccc tttctggccg ttcaactctac cacctgcctg tctcattgca ttgtgccttt 180  
gaaaattatg acaataacaa ccaatgagaa aaaatatgat cctcctgcaa tgaatccact 240  
ggagggggta cggagcttgg aatgctccta agattccgac ctaatcagcg tcgagccgaa 300  
tcagtagctg cagcactcg cctcagtgc 360  
tttgttaggaa cagggactgt cctgggttccg  
cctgacgggg agacacttcg agaagggct gaagatgccg gggcagaacg gttgtgcgcc 420  
atgtgcgcct tgaccaggtg accggcggtc agggcagcac atagcgagag ctccccagcc 480  
aaaacagcgc ttccgatgat ggcgcgaatg tgacgtgcattt ctcaccggg agtggtcggg 540  
tgtgatccgc ggacaccaag catgtcaagc attgcgcctt ggggctccag aatcgatcca 600

ccgccccaaacg ttccaacctc aatagacggc atggagacag agatttgaag cgatccgcga 660

agattgttca tgagagtgtat gcagtttagcg ctctccacaa cttgcgcggg atcctgacct 720

gtggcaatga aaatggctgc cgcaagattt gcagcttggg cgttg 765

<210> 33

<211> 802

<212> DNA

<213> *Penicillium citrinum*

<400> 33

aactggaaga attcgccggcc gcaggaattt tttttttttt tttttataga atctttgaaa 60

tcgacattaa ttaagtatgt ggagattctt tgtggaggca cggtaatgtg tctatctagc 120

aacgcggta ca agcatcagtc tcaggcacag cccgggtgtc gttttgggtt gcaatcttcc 180

gccatcccat tccaaaggca aacacaaacg tgcacgcgt agctcccact gctaagtaaa 240

aagtatgatc aacggcgaga ctgtaagctt ttacaacccc tggaaggta ttcttgctga 300

ccacatctct gaagccagtc gcccctgctg ccgtcacggc ctgcgtgtcg acagtggcgc 360

catacttgct caggccagtt ctcaaaccgg acccaaagac aaggtagca aagtccagga 420

agagcgatcc tccaaacgtc tgtccaaaca cggcgagaga aattccgagg gcaccttgtt 480

cgggcgaaag cgtgcttgg atggcgatga taggcgtttg catgccacaa ccacgaccga 540

agcccgcgat aaattggtaatc atgaccatt tcacagtta tgtatgggc tggaagggtgg 600

ataccagacc tgcgcctatg gcgacgagaa cagcgctgcc tagggcccaa ggcaaatagt 660

atcctgtctt tccaaattgctg aagccagaaa ccatagccat aatgacttgtt ccaagaattc 720

caggcaacat gtacacacca ctcagtgtgg gagaaacatc cttcacagcc tggaagtaga 780

tcggtagata gtaggaaaag ac 802

<210> 34

<211> 562

<212> DNA

<213> *Penicillium citrinum*

<400> 34

aactggaaga attcgccggcc gcaggaattt tttttttt ttttttttac taagcaatat 60

tgtgtttctt cgctaattgcg aatatttcct tatagcaacg tcgcaacaca tttatcgct 120

tccctgaggc ctttgttgac ttgggctctt cgtctccggc ttgcgtcactc caaaggcacag 180

ataggagacg agaggccggc gttatggttt tattttcagc gccaggatt tgccacgatg 240

tgcttggcat atctgatagg actagacgaa tagatgccgc agccccgtgc tcctgtgcta 300

tccccaaagc agtctcaatc ccactcaata gtcgaaggct tacacgcaat gtcgtgcatt 360

cagaagataa ggctgtgcatt aatgggtcga gatgtgaaat gagctcgccg atatgaagat 420

tagagtgaaa cgagggaaatg gcttcggctc ttccattgtc atttctatgtg gtttgagccag 480

accagtacca atccattcgt gtgcattgtc ttgtccaca aggttggct ttcatcacct 540

cggatagtag cagctggaa ag 562

<210> 35

<211> 26

<212> DNA

<213> Penicillium citrinum

<400> 35

gttaacatgt cagaacctct accccc

26

<210> 36

<211> 27

<212> DNA

<213> Penicillium citrinum

<400> 36

aatatttcaa gcatcagtct caggcac

27

<210> 37

<211> 1662

<212> DNA

<213> Penicillium citrinum

<220>

<221> CDS

<222> (1)..(1662)

<400> 37

atg tca gaa cct cta ccc cct aaa gaa ggg gaa cca agg cca cag aag

48

Met Ser Glu Pro Leu Pro Pro Lys Glu Gly Glu Pro Arg Pro Gln Lys

1

5

10

15

gaa gaa agt caa aat gac acg ctc gaa gcg act gag tcc aag tcc cag

96

Glu Glu Ser Gln Asn Asp Thr Leu Glu Ala Thr Glu Ser Lys Ser Gln

20

25

30

cac atc aca ggc ctc aag ctc ggg ctg gtg gtt gct tca gtt act ttc

144

His Ile Thr Gly Leu Lys Leu Gly Leu Val Val Ala Ser Val Thr Phe

35

40

45

gta gca ttt ttg atg ctc ctt gat atg tcc att atc gtc acg gca atc			192
Val Ala Phe Leu Met Leu Leu Asp Met Ser Ile Ile Val Thr Ala Ile			
50	55	60	
cca cat atc aca agc gag ttc cac tct ctg aac gat gta ggg tgg tac			240
Pro His Ile Thr Ser Glu Phe His Ser Leu Asn Asp Val Gly Trp Tyr			
65	70	75	80
ggc agt gct tat ctt ctg gct aac tgt gct ctc cag ccc ctg gcc ggt			288
Gly Ser Ala Tyr Leu Leu Ala Asn Cys Ala Leu Gln Pro Leu Ala Gly			
85	90	95	
aaa ttg tat aca ctc ttg ggc ttg aag tac act ttc ttt gcc ttc ctc			336
Lys Leu Tyr Thr Leu Leu Gly Leu Lys Tyr Thr Phe Phe Ala Phe Leu			
100	105	110	
tgt att ttt gaa cta ggc tcg gtg cta tgc ggt gcc gca aga tct tcc			384
Cys Ile Phe Glu Leu Gly Ser Val Leu Cys Gly Ala Ala Arg Ser Ser			
115	120	125	
acc atg ttg att gtt ggg cgg gcc gtt gct gga atg gga ggc tca ggt			432
Thr Met Leu Ile Val Gly Arg Ala Val Ala Gly Met Gly Gly Ser Gly			
130	135	140	
ctt gtc aac gga gcc ctc aca atc ctc tca aca gct gct cct aag cac			480
Leu Val Asn Gly Ala Leu Thr Ile Leu Ser Thr Ala Ala Pro Lys His			
145	150	155	160
aag caa cca gtt ttg att gga gtg atg atg ggt ctt agt cag att gcc			528
Lys Gln Pro Val Leu Ile Gly Val Met Met Gly Leu Ser Gln Ile Ala			
165	170	175	
att gtc tgt gga cca ctg ctc gga ggt gct ttc act caa cac gcc act			576
Ile Val Cys Gly Pro Leu Leu Gly Gly Ala Phe Thr Gln His Ala Thr			
180	185	190	

tgg cga tgg tgc ttt tat atc aat ctc ccc atc ggc gct gtc gct gca			624
Trp Arg Trp Cys Phe Tyr Ile Asn Leu Pro Ile Gly Ala Val Ala Ala			
195	200	205	
ttc ctc ctt ctc gtc atc acc ata ccc gac cga att tca tcc acg gac			672
Phe Leu Leu Leu Val Ile Thr Ile Pro Asp Arg Ile Ser Ser Thr Asp			
210	215	220	
agc gaa ctc tcg acc gac aaa cca atg gcc aac ata aaa tcc aca ctt			720
Ser Glu Leu Ser Thr Asp Lys Pro Met Ala Asn Ile Lys Ser Thr Leu			
225	230	235	240
cgc aaa ctg gac ctt gta ggc ttt gtg gtc ttt gca gcc ttc gca acc			768
Arg Lys Leu Asp Leu Val Gly Phe Val Val Phe Ala Ala Phe Ala Thr			
245	250	255	
atg att tcc ctc gca cta gaa tgg gga ggg tcg acc tac acc tgg cga			816
Met Ile Ser Leu Ala Leu Glu Trp Gly Gly Ser Thr Tyr Thr Trp Arg			
260	265	270	
agt tcc gtc atc atc ggc ctg ttc tgt ggc gga ggg ttt gct ctg att			864
Ser Ser Val Ile Ile Gly Leu Phe Cys Gly Gly Phe Ala Leu Ile			
275	280	285	
gcg ttc gtg cta tgg gag cgt cat gtt ggc gat gct gtt gcc atg att			912
Ala Phe Val Leu Trp Glu Arg His Val Gly Asp Ala Val Ala Met Ile			
290	295	300	
cct ggc tca gtg gct ggt aaa cga caa gtg tgg tgc tct tgt tta ttt			960
Pro Gly Ser Val Ala Gly Lys Arg Gln Val Trp Cys Ser Cys Leu Phe			
305	310	315	320
atg ggc ttt ttc tct ggc tcc ttg ctt gtc ttt tcc tac tat cta ccg			1008
Met Gly Phe Phe Ser Gly Ser Leu Leu Val Phe Ser Tyr Tyr Leu Pro			
325	330	335	

atc tac ttc cag gct gtg aag gat gtt tct ccc aca ctg agt ggt gtg Ile Tyr Phe Gln Ala Val Lys Asp Val Ser Pro Thr Leu Ser Gly Val	340	345	350	1056	
tac atg ttg cct gga att ctt gga caa gtc att atg gct atg gtt tct Tyr Met Leu Pro Gly Ile Leu Gly Gln Val Ile Met Ala Met Val Ser	355	360	365	1104	
ggc ttc gca att gga aag aca gga tac tat ttg cct tgg gcc cta ggc Gly Phe Ala Ile Gly Lys Thr Gly Tyr Tyr Leu Pro Trp Ala Leu Gly	370	375	380	1152	
agc gct gtt ctc gtc gcc ata ggc gca ggt ctg gta tcc acc ttc cag Ser Ala Val Leu Val Ala Ile Gly Ala Gly Leu Val Ser Thr Phe Gln	385	390	395	400	1200
ccc cat aca tca act gtg aaa tgg gtc atg tac caa ttt atc gcg ggc Pro His Thr Ser Thr Val Lys Trp Val Met Tyr Gln Phe Ile Ala Gly	405	410	415	1248	
ttc ggt cgt ggt tgt ggc atg caa acg cct atc atc gcc atc caa agc Phe Gly Arg Gly Cys Gly Met Gln Thr Pro Ile Ile Ala Ile Gln Ser	420	425	430	1296	
acg ctt tcg ccc gaa caa ggt gcc ctc gga att tct ctc gcc gtg ttt Thr Leu Ser Pro Glu Gln Gly Ala Leu Gly Ile Ser Leu Ala Val Phe	435	440	445	1344	
gga cag acg ttt gga gga tcg ctc ttc ctg gac ttt gct aac ctt gtc Gly Gln Thr Phe Gly Gly Ser Leu Phe Leu Asp Phe Ala Asn Leu Val	450	455	460	1392	
ttt ggg tcc ggt ttg aga act ggc ctg agc aag tat gcg ccc act gtc Phe Gly Ser Gly Leu Arg Thr Gly Leu Ser Lys Tyr Ala Pro Thr Val	465	470	475	480	1440

gac acg cag gcc gtg acg gca gca ggg gcg act ggc ttc aga gat gtg      1488  
Asp Thr Gln Ala Val Thr Ala Ala Gly Ala Thr Gly Phe Arg Asp Val  
485                  490                  495

gtc agc aag aat aac ctt cca ggg gtt gta aaa gct tac agt ctc gcc      1536  
Val Ser Lys Asn Asn Leu Pro Gly Val Val Lys Ala Tyr Ser Leu Ala  
500                  505                  510

gtt gat cat act ttt tac tta gca gtg gga gct acg gcg tgc acg ttt      1584  
Val Asp His Thr Phe Tyr Leu Ala Val Gly Ala Thr Ala Cys Thr Phe  
515                  520                  525

gtg ttt gcc ttt gga atg gga tgg cgg aag att gca acc aaa aac gac      1632  
Val Phe Ala Phe Gly Met Gly Trp Arg Lys Ile Ala Thr Lys Asn Asp  
530                  535                  540

acc cgg gct gtg cct gag act gat gct tga      1662  
Thr Arg Ala Val Pro Glu Thr Asp Ala  
545                  550

<210> 38  
<211> 553  
<212> PRT  
<213> *Penicillium citrinum*

<400> 38

Met Ser Glu Pro Leu Pro Pro Lys Glu Gly Glu Pro Arg Pro Gln Lys  
1                  5                  10                  15

Glu Glu Ser Gln Asn Asp Thr Leu Glu Ala Thr Glu Ser Lys Ser Gln  
20                  25                  30

His Ile Thr Gly Leu Lys Leu Gly Leu Val Val Ala Ser Val Thr Phe  
35 40 45

Val Ala Phe Leu Met Leu Leu Asp Met Ser Ile Ile Val Thr Ala Ile  
50 55 60

Pro His Ile Thr Ser Glu Phe His Ser Leu Asn Asp Val Gly Trp Tyr  
65 70 75 80

Gly Ser Ala Tyr Leu Leu Ala Asn Cys Ala Leu Gln Pro Leu Ala Gly  
85 90 95

Lys Leu Tyr Thr Leu Leu Gly Leu Lys Tyr Thr Phe Phe Ala Phe Leu  
100 105 110

Cys Ile Phe Glu Leu Gly Ser Val Leu Cys Gly Ala Ala Arg Ser Ser  
115 120 125

Thr Met Leu Ile Val Gly Arg Ala Val Ala Gly Met Gly Gly Ser Gly  
130 135 140

Leu Val Asn Gly Ala Leu Thr Ile Leu Ser Thr Ala Ala Pro Lys His  
145 150 155 160

Lys Gln Pro Val Leu Ile Gly Val Met Met Gly Leu Ser Gln Ile Ala  
165 170 175

Ile Val Cys Gly Pro Leu Leu Gly Gly Ala Phe Thr Gln His Ala Thr  
180 185 190

Trp Arg Trp Cys Phe Tyr Ile Asn Leu Pro Ile Gly Ala Val Ala Ala  
195 200 205

Phe Leu Leu Leu Val Ile Thr Ile Pro Asp Arg Ile Ser Ser Thr Asp  
210 215 220

Ser Glu Leu Ser Thr Asp Lys Pro Met Ala Asn Ile Lys Ser Thr Leu  
225 230 235 240

Arg Lys Leu Asp Leu Val Gly Phe Val Val Phe Ala Ala Phe Ala Thr  
245 250 255

Met Ile Ser Leu Ala Leu Glu Trp Gly Gly Ser Thr Tyr Thr Trp Arg  
260 265 270

Ser Ser Val Ile Ile Gly Leu Phe Cys Gly Gly Phe Ala Leu Ile  
275 280 285

Ala Phe Val Leu Trp Glu Arg His Val Gly Asp Ala Val Ala Met Ile  
290 295 300

Pro Gly Ser Val Ala Gly Lys Arg Gln Val Trp Cys Ser Cys Leu Phe  
305 310 315 320

Met Gly Phe Phe Ser Gly Ser Leu Leu Val Phe Ser Tyr Tyr Leu Pro  
325 330 335

Ile Tyr Phe Gln Ala Val Lys Asp Val Ser Pro Thr Leu Ser Gly Val  
340 345 350

Tyr Met Leu Pro Gly Ile Leu Gly Gln Val Ile Met Ala Met Val Ser  
355 360 365

Gly Phe Ala Ile Gly Lys Thr Gly Tyr Tyr Leu Pro Trp Ala Leu Gly  
370 375 380

Ser Ala Val Leu Val Ala Ile Gly Ala Gly Leu Val Ser Thr Phe Gln  
385 390 395 400

Pro His Thr Ser Thr Val Lys Trp Val Met Tyr Gln Phe Ile Ala Gly  
405 410 415

Phe Gly Arg Gly Cys Gly Met Gln Thr Pro Ile Ile Ala Ile Gln Ser  
420 425 430

Thr Leu Ser Pro Glu Gln Gly Ala Leu Gly Ile Ser Leu Ala Val Phe  
435 440 445

Gly Gln Thr Phe Gly Gly Ser Leu Phe Leu Asp Phe Ala Asn Leu Val  
450 455 460

Phe Gly Ser Gly Leu Arg Thr Gly Leu Ser Lys Tyr Ala Pro Thr Val  
465                  470                  475                  480

Asp Thr Gln Ala Val Thr Ala Ala Gly Ala Thr Gly Phe Arg Asp Val  
485                  490                  495

Val Ser Lys Asn Asn Leu Pro Gly Val Val Lys Ala Tyr Ser Leu Ala  
500                  505                  510

Val Asp His Thr Phe Tyr Leu Ala Val Gly Ala Thr Ala Cys Thr Phe  
515                  520                  525

Val Phe Ala Phe Gly Met Gly Trp Arg Lys Ile Ala Thr Lys Asn Asp  
530                  535                  540

Thr Arg Ala Val Pro Glu Thr Asp Ala  
545                  550

<210> 39  
<211> 31  
<212> DNA  
<213> Penicillium citrinum

<400> 39  
ggatccatgt ccctggcgca tgcaacgatt c                  31

<210> 40  
<211> 30

<212> DNA

<213> Penicillium citrinum

<400> 40

ggatccctaa gcaatattgt gtttcttcgc 30

<210> 41

<211> 1380

<212> DNA

<213> Penicillium citrinum

<220>

<221> CDS

<222> (1)..(1380)

<400> 41

atg tcc ctg ccg cat gca acg att ccg acg aac cta cgc cgt cgc gcg 48  
Met Ser Leu Pro His Ala Thr Ile Pro Thr Asn Leu Arg Arg Arg Ala  
1 5 10 15

ttt cga cgc tca tgt gac cgg tgt cat gca caa aag ctc aaa tgt acc 96  
Phe Arg Arg Ser Cys Asp Arg Cys His Ala Gln Lys Leu Lys Cys Thr  
20 25 30

ggc agc aat gcc aat tta gtc cgt gct cag tgt caa cgt tgt caa caa 144  
Gly Ser Asn Ala Asn Leu Val Arg Ala Gln Cys Gln Arg Cys Gln Gln  
35 40 45

gcc gga tta agg tgt gtg tac agc gaa agg cta ccc aag cgc aat tta 192  
Ala Gly Leu Arg Cys Val Tyr Ser Glu Arg Leu Pro Lys Arg Asn Leu  
50 55 60

cat aaa gaa gcc gca gct gga act aca aga gcc aca gaa acc tca caa 240  
His Lys Glu Ala Ala Ala Gly Thr Thr Arg Ala Thr Glu Thr Ser Gln  
65 70 75 80

ccg atg acc gcg aca tct tct acg gtc ttc tca tca ttg gca gag act		288
Pro Met Thr Ala Thr Ser Ser Thr Val Phe Ser Ser Leu Ala Glu Thr		
85	90	95
cct cca cct tac tgc tca cca cct acg cat att ggc acc tcg gca ctc		336
Pro Pro Pro Tyr Cys Ser Pro Pro Thr His Ile Gly Thr Ser Ala Leu		
100	105	110
aag gaa aca tta tca gaa cca tca gcg gca acc ctg caa ttc tat gat		384
Lys Glu Thr Leu Ser Glu Pro Ser Ala Ala Thr Leu Gln Phe Tyr Asp		
115	120	125
aca tca atc aac ttt gat gat ccc gag tcg ttt ccc ggc ggc tgg cct		432
Thr Ser Ile Asn Phe Asp Asp Pro Glu Ser Phe Pro Gly Gly Trp Pro		
130	135	140
cag cca aat aca ttt cgc gac gat gcc aac agc aat gaa tct tcg ggg		480
Gln Pro Asn Thr Phe Arg Asp Asp Ala Asn Ser Asn Glu Ser Ser Gly		
145	150	155
160		
ata cca gat cta ggc tac gac ttt gaa ggc cct ttg gat gca acg gcg		528
Ile Pro Asp Leu Gly Tyr Asp Phe Glu Gly Pro Leu Asp Ala Thr Ala		
165	170	175
cct gtc tcg cca tcg ctg ttt gac ctc gaa gta gag ggg aac tcg tca		576
Pro Val Ser Pro Ser Leu Phe Asp Leu Glu Val Glu Gly Asn Ser Ser		
180	185	190
tcc gga caa tcc aac aca agc aac acg caa cga gac ctt ttc gaa agt		624
Ser Gly Gln Ser Asn Thr Ser Asn Thr Gln Arg Asp Leu Phe Glu Ser		
195	200	205
ctg tcg gat gtg tca cag gac cta gag gta ata ctc cac ggg gtg act		672
Leu Ser Asp Val Ser Gln Asp Leu Glu Val Ile Leu His Gly Val Thr		
210	215	220

gtg gaa tgg ccc aag caa aaa att tta agc tac ccg ata ggg gac ttt			720
Val Glu Trp Pro Lys Gln Lys Ile Leu Ser Tyr Pro Ile Gly Asp Phe			
225	230	235	240
ttg aat gcc ttt ggt aga ttg cta cta cat ctt caa gaa cgt gtg atc			768
Leu Asn Ala Phe Gly Arg Leu Leu Leu His Leu Gln Glu Arg Val Ile			
245	250	255	
acg agc agc aat agc agc atg tta gat ggg tgt ctg caa acc aac aac			816
Thr Ser Ser Asn Ser Ser Met Leu Asp Gly Cys Leu Gln Thr Lys Asn			
260	265	270	
ttg ttc atg gcg gtg cat tgc tac atg ttg tct gtc aaa atc atg aca			864
Leu Phe Met Ala Val His Cys Tyr Met Leu Ser Val Lys Ile Met Thr			
275	280	285	
tca ctt tcc cag ctg cta cta tcc gag gtg atg aaa gcc caa cct tgt			912
Ser Leu Ser Gln Leu Leu Leu Ser Glu Val Met Lys Ala Gln Pro Cys			
290	295	300	
gga caa aag caa agc aca cga atg gat tgg tac tgg tct ggc tca acc			960
Gly Gln Lys Gln Ser Thr Arg Met Asp Trp Tyr Trp Ser Gly Ser Thr			
305	310	315	320
act aga aat gac aat gga aga gcc gaa gca ctt ccc tgc ttt cac tct			1008
Thr Arg Asn Asp Asn Gly Arg Ala Glu Ala Leu Pro Ser Phe His Ser			
325	330	335	
aat ctt cat atc ggc gag ctc att tca cat ctc gac cca ttc atg cac			1056
Asn Leu His Ile Gly Glu Leu Ile Ser His Leu Asp Pro Phe Met His			
340	345	350	
gcc tta tct tct gca tgc acg aca ttg cgt gta agc ctt cga cta ttg			1104
Ala Leu Ser Ser Ala Cys Thr Thr Leu Arg Val Ser Leu Arg Leu Leu			
355	360	365	

agt gag att gag act gct ttg ggg ata gca cag gag cac ggg gct gcg      1152  
Ser Glu Ile Glu Thr Ala Leu Gly Ile Ala Gln Glu His Gly Ala Ala

370                375                380

gca tct att cgt cta gtc cta tca gat atg cca agc aca tcg tgg caa      1200  
Ala Ser Ile Arg Leu Val Leu Ser Asp Met Pro Ser Thr Ser Trp Gln  
385                390                395                400

atc ctt ggc gct gaa aat aaa acc ata acg ccg gcc tct cgt ctc cta      1248  
Ile Leu Gly Ala Glu Asn Lys Thr Ile Thr Pro Ala Ser Arg Leu Leu  
405                410                415

tct gtg ctt tgg agt gac gaa gcc gga gac gaa gag ccc aag tca aca      1296  
Ser Val Leu Trp Ser Asp Glu Ala Gly Asp Glu Glu Pro Lys Ser Thr  
420                425                430

aag gcc tca ggg aag acg ata aat ttg ttg cga cgt tgc tat aag gaa      1344  
Lys Ala Ser Gly Lys Thr Ile Asn Val Leu Arg Arg Cys Tyr Lys Glu  
435                440                445

ata ttc gca tta gcg aag aaa cac aat att gct tag      1380  
Ile Phe Ala Leu Ala Lys Lys His Asn Ile Ala  
450                455

<210> 42

<211> 459

<212> PRT

<213> Penicillium citrinum

<400> 42

Met Ser Leu Pro His Ala Thr Ile Pro Thr Asn Leu Arg Arg Arg Ala  
1                5                10                15

Phe Arg Arg Ser Cys Asp Arg Cys His Ala Gln Lys Leu Lys Cys Thr  
20 25 30

Gly Ser Asn Ala Asn Leu Val Arg Ala Gln Cys Gln Arg Cys Gln Gln  
35 40 45

Ala Gly Leu Arg Cys Val Tyr Ser Glu Arg Leu Pro Lys Arg Asn Leu  
50 55 60

His Lys Glu Ala Ala Ala Gly Thr Thr Arg Ala Thr Glu Thr Ser Gln  
65 70 75 80

Pro Met Thr Ala Thr Ser Ser Thr Val Phe Ser Ser Leu Ala Glu Thr  
85 90 95

Pro Pro Pro Tyr Cys Ser Pro Pro Thr His Ile Gly Thr Ser Ala Leu  
100 105 110

Lys Glu Thr Leu Ser Glu Pro Ser Ala Ala Thr Leu Gln Phe Tyr Asp  
115 120 125

Thr Ser Ile Asn Phe Asp Asp Pro Glu Ser Phe Pro Gly Gly Trp Pro  
130 135 140

Gln Pro Asn Thr Phe Arg Asp Asp Ala Asn Ser Asn Glu Ser Ser Gly  
145 150 155 160

Ile Pro Asp Leu Gly Tyr Asp Phe Glu Gly Pro Leu Asp Ala Thr Ala  
165                    170                    175

Pro Val Ser Pro Ser Leu Phe Asp Leu Glu Val Glu Gly Asn Ser Ser  
180                    185                    190

Ser Gly Gln Ser Asn Thr Ser Asn Thr Gln Arg Asp Leu Phe Glu Ser  
195                    200                    205

Leu Ser Asp Val Ser Gln Asp Leu Glu Val Ile Leu His Gly Val Thr  
210                    215                    220

Val Glu Trp Pro Lys Gln Lys Ile Leu Ser Tyr Pro Ile Gly Asp Phe  
225                    230                    235                    240

Leu Asn Ala Phe Gly Arg Leu Leu Leu His Leu Gln Glu Arg Val Ile  
245                    250                    255

Thr Ser Ser Asn Ser Ser Met Leu Asp Gly Cys Leu Gln Thr Lys Asn  
260                    265                    270

Leu Phe Met Ala Val His Cys Tyr Met Leu Ser Val Lys Ile Met Thr  
275                    280                    285

Ser Leu Ser Gln Leu Leu Leu Ser Glu Val Met Lys Ala Gln Pro Cys  
290                    295                    300

Gly Gln Lys Gln Ser Thr Arg Met Asp Trp Tyr Trp Ser Gly Ser Thr  
305                    310                    315                    320

Thr Arg Asn Asp Asn Gly Arg Ala Glu Ala Leu Pro Ser Phe His Ser  
325                    330                    335

Asn Leu His Ile Gly Glu Leu Ile Ser His Leu Asp Pro Phe Met His  
340                    345                    350

Ala Leu Ser Ser Ala Cys Thr Thr Leu Arg Val Ser Leu Arg Leu Leu  
355                    360                    365

Ser Glu Ile Glu Thr Ala Leu Gly Ile Ala Gln Glu His Gly Ala Ala  
370                    375                    380

Ala Ser Ile Arg Leu Val Leu Ser Asp Met Pro Ser Thr Ser Trp Gln  
385                    390                    395                    400

Ile Leu Gly Ala Glu Asn Lys Thr Ile Thr Pro Ala Ser Arg Leu Leu  
405                    410                    415

Ser Val Leu Trp Ser Asp Glu Ala Gly Asp Glu Glu Pro Lys Ser Thr  
420                    425                    430

Lys Ala Ser Gly Lys Thr Ile Asn Val Leu Arg Arg Cys Tyr Lys Glu  
435                    440                    445

Ile Phe Ala Leu Ala Lys Lys His Asn Ile Ala

450

455

<210> 43

<211> 9099

<212> DNA

<213> *Penicillium citrinum*

<220>

<221> CDS

<222> (1)..(9099)

<400> 43

atg gat caa gcc aac tat cca aac gag cca att gtg gta gtg gga agc 48

Met Asp Gln Ala Asn Tyr Pro Asn Glu Pro Ile Val Val Val Gly Ser

1

5

10

15

ggt tgt cgg ttt cca ggt ggt gtc aac aca cca tca aaa ctt tgg gag 96

Gly Cys Arg Phe Pro Gly Gly Val Asn Thr Pro Ser Lys Leu Trp Glu

20

25

30

ctg ctc aaa gag ccc cgg gat gta cag acc aag atc cct aag gag aga 144

Leu Leu Lys Glu Pro Arg Asp Val C!n Thr Lys Ile Pro Lys Glu Arg

35

40

45

ttt gac gtc gat aca ttt tac agc ccc gat ggc act cac ccc ggg cgc 192

Phe Asp Val Asp Thr Phe Tyr Ser Pro Asp Gly Thr His Pro Gly Arg

50

55

60

acg aac gca ccc ttt gca tac ttg ctg cag gag gat cta cgc ggt ttt 240

Thr Asn Ala Pro Phe Ala Tyr Leu Leu Gln Glu Asp Leu Arg Gly Phe

65

70

75

80

gat gcc tct ttc ttc aac atc caa gct gga gag gcc gaa acg att gac 288

Asp Ala Ser Phe Phe Asn Ile Gln Ala Gly Glu Ala Glu Thr Ile Asp			
85	90	95	
cca cag caa agg ctg ctg gag acg gtc tat gaa gct gta tcc aac			336
Pro Gln Gln Arg Leu Leu Leu Glu Thr Val Tyr Glu Ala Val Ser Asn			
100	105	110	
gca ggc cta cgg atc caa ggc ctt caa gga tcc tct act gct gtg tac			384
Ala Gly Leu Arg Ile Gln Gly Leu Gln Gly Ser Ser Thr Ala Val Tyr			
115	120	125	
gtc ggt atg atg acg cat gac tat gag act atc gtg acg cgt gaa ttg			432
Val Gly Met Met Thr His Asp Tyr Glu Thr Ile Val Thr Arg Glu Leu			
130	135	140	
gat agt att cct aca tac tct gcc acg ggg gta gct gtc agt gtg gcc			480
Asp Ser Ile Pro Thr Tyr Ser Ala Thr Gly Val Ala Val Ser Val Ala			
145	150	155	160
tcc aac cgt gta tca tac ttc ttc gac tgg cat ggg ccg agt atg acg			528
Ser Asn Arg Val Ser Tyr Phe Phe Asp Trp His Gly Pro Ser Met Thr			
165	170	175	
atc gac aca gcc tgt agt tca tcc tta gct gcc gtg cat ctg gcc gtc			576
Ile Asp Thr Ala Cys Ser Ser Ser Leu Ala Ala Val His Leu Ala Val			
180	185	190	
caa cag ctt aga acg ggc gag agt acc atg gcg gtt gca gcc ggt gcg			624
Gln Gln Leu Arg Thr Gly Glu Ser Thr Met Ala Val Ala Ala Gly Ala			
195	200	205	
aat ctg ata ttg ggc ccc atg acc ttt gta atg gag agc aaa ttg aac			672
Asn Leu Ile Leu Gly Pro Met Thr Phe Val Met Glu Ser Lys Leu Asn			
210	215	220	
atg ctg tcc ccc aat ggt aga tct cga atg tgg gat gct gct gcc gat			720

Met Leu Ser Pro Asn Gly Arg Ser Arg Met Trp Asp Ala Ala Ala Asp  
225 230 235 240

gga tat gcc aga gga gaa ggt gtt tgc tct att gtc ctg aaa acg ctg 768  
Gly Tyr Ala Arg Gly Glu Gly Val Cys Ser Ile Val Leu Lys Thr Leu  
245 250 255

agc cag gca ctg cgc gac ggg gac agt atc gag tgt gtt atc cga gag 816  
Ser Gln Ala Leu Arg Asp Gly Asp Ser Ile Glu Cys Val Ile Arg Glu  
260 265 270

acc ggt atc aac caa gat ggc cga acg aca ggt atc aca atg cca aac 864  
Thr Gly Ile Asn Gln Asp Gly Arg Thr Thr Gly Ile Thr Met Pro Asn  
275 280 285

cat agc gca caa gaa gcc ctc att cgg gcc aca tat gcc aag gct ggt 912  
His Ser Ala Gln Glu Ala Leu Ile Arg Ala Thr Tyr Ala Lys Ala Gly  
290 295 300

ctt gat att acc aac ccc cag gaa cgc tgc cag ttc ttt gaa gcc cat 960  
Leu Asp Ile Thr Asn Pro Gln Glu Arg Cys Gln Phe Phe Glu Ala His  
305 310 315 320

gga act ggt aca cca gcc ggt gac cca cag gaa gct gag gct att gca 1008  
Gly Thr Gly Thr Pro Ala Gly Asp Pro Gln Glu Ala Glu Ala Ile Ala  
325 330 335

aca gcc ttc ttc gga cac aag gat gga aca atc gac agc gac ggc gag 1056  
Thr Ala Phe Phe Gly His Lys Asp Gly Thr Ile Asp Ser Asp Gly Glu  
340 345 350

aaa gat gag ctt ttt gtc ggc agc atc aag aca gtt ctc ggt cac acg 1104  
Lys Asp Glu Leu Phe Val Gly Ser Ile Lys Thr Val Leu Gly His Thr  
355 360 365

gaa ggc act gct ggt att gcg ggc tta atg aag gca tcg itt gct gta 1152

Glu Gly Thr Ala Gly Ile Ala Gly Leu Met Lys Ala Ser Phe Ala Val  
370 375 380

cga aat ggc gtg atc ccg cca aac ctg ctg ttt gag aag atc agt ccc 1200  
Arg Asn Gly Val Ile Pro Pro Asn Leu Leu Phe Glu Lys Ile Ser Pro  
385 390 395 400

cgt gtc gct ccg ttc tat acg cac ttg aaa att gca acg gag gcc aca 1248  
Arg Val Ala Pro Phe Tyr Thr His Leu Lys Ile Ala Thr Glu Ala Thr  
405 410 415

gaa tgg ccg att gtt gcg ccc ggg cag cct cgc aga gtc agc gtt aat 1296  
Glu Trp Pro Ile Val Ala Pro Gly Gln Pro Arg Arg Val Ser Val Asn  
420 425 430

tca ttt gga ttt ggt ggt aca aat gcc cat gct att atc gaa gag tat 1344  
Ser Phe Gly Phe Gly Gly Thr Asn Ala His Ala Ile Ile Glu Glu Tyr  
435 440 445

atg gct cct cca cac aag ccg aca gca gtg gta aca gag gtg acc tca 1392  
Met Ala Pro Pro His Lys Pro Thr Ala Val Val Thr Glu Val Thr Ser  
450 455 460

gat gca gat gca tgc agc ttg ccc ctt gtg ctt tca tcg aag tcg cag 1440  
Asp Ala Asp Ala Cys Ser Leu Pro Leu Val Leu Ser Ser Lys Ser Gln  
465 470 475 480

cgc tcc atg aag gca acg cta gaa aat atg ctc caa ttt ctg gaa acg 1488  
Arg Ser Met Lys Ala Thr Leu Glu Asn Met Leu Gln Phe Leu Glu Thr  
485 490 495

cat gat gac gtg gac atg cat gat atc gca tat acc tta ctt gag aaa 1536  
His Asp Asp Val Asp Met His Asp Ile Ala Tyr Thr Leu Leu Glu Lys  
500 505 510

cgg tct atc ttg ccc ttc cgt cgt gcg att gca gca cac aac aag gaa 1584

Arg Ser Ile Leu Pro Phe Arg Arg Ala Ile Ala Ala His Asn Lys Glu			
515	520	525	
gta gcc cgc gcg gca ctg gag gct gcc atc gcg gac ggt gag gtc gtc	1632		
Val Ala Arg Ala Ala Leu Glu Ala Ala Ile Ala Asp Gly Glu Val Val			
530	535	540	
acc gac ttc cgc acc gac gcg aat gac aac cct cgc gta cta ggt gtc	1680		
Thr Asp Phe Arg Thr Asp Ala Asn Asp Asn Pro Arg Val Leu Gly Val			
545	550	555	560
ttt act ggc caa ggt gca cag tgg ccg ggc atg ctg aag aag ctc atg	1728		
Phe Thr Gly Gln Gly Ala Gln Trp Pro Gly Met Leu Lys Lys Leu Met			
565	570	575	
gtg ggt atg cca ttt gtg aga ggc att ctc gaa gag ctg gat aat tca	1776		
Val Gly Met Pro Phe Val Arg Gly Ile Leu Glu Glu Leu Asp Asn Ser			
580	585	590	
ctg caa aca ctg cct gaa aag tat cgg cct acg tgg aca ctg tat gac	1824		
Leu Gln Thr Leu Pro Glu Lys Tyr Arg Pro Thr Trp Thr Leu Tyr Asp			
595	600	605	
cag ctc atg ctt gaa ggg gat gcc tca aac gtc aga ctc gcc agc ttc	1872		
Gln Leu Met Leu Glu Gly Asp Ala Ser Asn Val Arg Leu Ala Ser Phe			
610	615	620	
tcc cag cct cta tgc tgc gcc gta caa atc gtt ctg gtc cga ctt ctc	1920		
Ser Gln Pro Leu Cys Cys Ala Val Gln Ile Val Leu Val Arg Leu Leu			
625	630	635	640
gct gca gct ggt atc gag ttc agt gca att gtc ggc cac agt tca ggt	1968		
Ala Ala Ala Gly Ile Glu Phe Ser Ala Ile Val Gly His Ser Ser Gly			
645	650	655	
gag att gcc tgt gcc ttt gcg gca gga ttc atc agt gcc act caa gct	2016		

Glu Ile Ala Cys Ala Phe Ala Ala Gly Phe Ile Ser Ala Thr Gln Ala			
660	665	670	
atc cgt att gcg cat ctg cgt gga gtt gtg tcc gcg gag cat gcc tct			2064
Ile Arg Ile Ala His Leu Arg Gly Val Val Ser Ala Glu His Ala Ser			
675	680	685	
tct cca agc ggc cag aca ggc gct atg cta gcg gca ggt atg tcg tac			2112
Ser Pro Ser Gly Gln Thr Gly Ala Met Leu Ala Ala Gly Met Ser Tyr			
690	695	700	
gat gac gca aag gaa cta tgc gag ctc gaa gcc ttt gag ggt cggt gtc			2160
Asp Asp Ala Lys Glu Leu Cys Glu Leu Glu Ala Phe Glu Gly Arg Val			
705	710	715	720
tgc gtc gcc gct agc aat tca ccg gat agt gtg acc ttc tcc ggc gac			2208
Cys Val Ala Ala Ser Asn Ser Pro Asp Ser Val Thr Phe Ser Gly Asp			
725	730	735	
atg gat gct atc cag cac gtt gaa ggt gtc ttg gag gat gaa tcc act			2256
Met Asp Ala Ile Gln His Val Glu Gly Val Leu Glu Asp Glu Ser Thr			
740	745	750	
ttt gcc aga atc ttg aga gtt gac aag gcc tac cat tcg cat cac atg			2304
Phe Ala Arg Ile Leu Arg Val Asp Lys Ala Tyr His Ser His His Met			
755	760	765	
cac cca tgc gca gct cca tat gtc aag gca ttg ctg gag tgc gac tgt			2352
His Pro Cys Ala Ala Pro Tyr Val Lys Ala Leu Leu Glu Cys Asp Cys			
770	775	780	
gct gtt gcc gat ggc caa ggt aac gat agt gtt gct tgg ttc tct gcc			2400
Ala Val Ala Asp Gly Gln Gly Asn Asp Ser Val Ala Trp Phe Ser Ala			
785	790	795	800
gtc cac gag acc agc aag caa atg act gta cag gat gtg atg ccc gct			2448

Val His Glu Thr Ser Lys Gln Met Thr Val Gln Asp Val Met Pro Ala  
805 810 815

tat tgg aaa gac aat ctc gtc tct ccg gtc ttg ttc tcg cag gct gtg 2496  
Tyr Trp Lys Asp Asn Leu Val Ser Pro Val Leu Phe Ser Gln Ala Val  
820 825 830

cag aaa gca gtc atc act cat cgt cta atc gac gtc gcc atc gaa att 2544  
Gln Lys Ala Val Ile Thr His Arg Leu Ile Asp Val Ala Ile Glu Ile  
835 840 845

ggc gcc cac cct gct ctc aag ggt ccg tgt cta gcc acc atc aag gat 2592  
Gly Ala His Pro Ala Leu Lys Gly Pro Cys Leu Ala Thr Ile Lys Asp  
850 855 860

gct ctt gcc ggt gtg gag ctg ccg tat acc ggg tgc ttg gca cga aac 2640  
Ala Leu Ala Gly Val Glu Leu Pro Tyr Thr Gly Cys Leu Ala Arg Asn  
865 870 875 880

gtt gac gat gtg gac gct ttt gct gga ggt ctg gga tac att tgg gag 2688  
Val Asp Asp Val Asp Ala Phe Ala Gly Gly Leu Gly Tyr Ile Trp Glu  
885 890 895

cgt ttc gga gtt cgg agt atc gac gcc gag ggc ttc gta caa caa gtc 2736  
Arg Phe Gly Val Arg Ser Ile Asp Ala Glu Gly Phe Val Gln Gln Val  
900 905 910

cgg ccc gat cgt gcc gtt caa aac ctg tca aag tca ttg ccc aca tac 2784  
Arg Pro Asp Arg Ala Val Gln Asn Leu Ser Lys Ser Leu Pro Thr Tyr  
915 920 925

tct tgg gat cat act cgt caa tac tgg gca gaa tct cgc tcc acc cgc 2832  
Ser Trp Asp His Thr Arg Gln Tyr Trp Ala Glu Ser Arg Ser Thr Arg  
930 935 940

cag cat ctt cgt gga ggt gcg ccc cat ctt ctg ctt gga aag ctt tct 2880

Gln His Leu Arg Gly Gly Ala Pro His Leu Leu Leu Gly Lys Leu Ser  
945 950 955 960

tct tac agc aca gca tcg acc ttc cag tgg aca aac ttc atc agg ccc 2928  
Ser Tyr Ser Thr Ala Ser Thr Phe Gln Trp Thr Asn Phe Ile Arg Pro  
965 970 975

cgg gat ctg gaa tgg ctc gac ggt cat gcg cta caa ggc cag act gtg 2976  
Arg Asp Leu Glu Trp Leu Asp Gly His Ala Leu Gln Gly Gln Thr Val  
980 985 990

ttc ccc gct gct ggg tac ata att atg gcc atg gaa gct gcc atg aag 3024  
Phe Pro Ala Ala Gly Tyr Ile Ile Met Ala Met Glu Ala Ala Met Lys  
995 1000 1005

gtg gct ggt gag cgt gcc gcc caa gtt cag ctc ctg gaa atc ttg 3069  
Val Ala Gly Glu Arg Ala Ala Gln Val Gln Leu Leu Glu Ile Leu  
1010 1015 1020

gac atg agc atc aac aaa gcc atc gtg ttt gaa gat gaa aac acc 3114  
Asp Met Ser Ile Asn Lys Ala Ile Val Phe Glu Asp Glu Asn Thr  
1025 1030 1035

tcc gtg gag ctg aac ttg aca gcc gaa gtc acc agt gac aat gat 3159  
Ser Val Glu Leu Asn Leu Thr Ala Glu Val Thr Ser Asp Asn Asp  
1040 1045 1050

gcg gat ggc caa gtc acg gtc aaa ttt gtt att gat tcc tgt ctg 3204  
Ala Asp Gly Gln Val Thr Val Lys Phe Val Ile Asp Ser Cys Leu  
1055 1060 1065

gca aag gag agt gag ctt tcg aca tcc gcc aaa ggc caa atc gtc 3249  
Ala Lys Glu Ser Glu Leu Ser Thr Ser Ala Lys Gly Gln Ile Val  
1070 1075 1080

ata acc ctt ggc gag gca tca ccg tca tcg cag ctt ttg ccg cca 3294

Ile Thr Leu Gly Glu Ala Ser Pro Ser Ser Gln Leu Leu Pro Pro			
1085	1090	1095	
cct gag gaa gag tac ccc cag atg aac aat gtc aac atc gat ttc			3339
Pro Glu Glu Glu Tyr Pro Gln Met Asn Asn Val Asn Ile Asp Phe			
1100	1105	1110	
ttc tat cgg gaa ctt gac ctc ctg ggg tat gac tac agc aaa gac			3384
Phe Tyr Arg Glu Leu Asp Leu Leu Gly Tyr Asp Tyr Ser Lys Asp			
1115	1120	1125	
ttc cgt cgt ttg cag acc atg aga agg gcc gac tcc aaa gct agc			3429
Phe Arg Arg Leu Gln Thr Met Arg Arg Ala Asp Ser Lys Ala Ser			
1130	1135	1140	
ggc acc ttg gct ttc ctt cca ctt aag gat gaa ttg cgc aat gag			3474
Gly Thr Leu Ala Phe Leu Pro Leu Lys Asp Glu Leu Arg Asn Glu			
1145	1150	1155	
ccc ctc ttg ctc cac cca gcg ccc ctg gac atc gcg ttc cag act			3519
Pro Leu Leu Leu His Pro Ala Pro Leu Asp Ile Ala Phe Gln Thr			
1160	1165	1170	
gtc att gga gcg tat tcc tct cca gga gat cgt cgc cta cgc tca			3564
Val Ile Gly Ala Tyr Ser Ser Pro Gly Asp Arg Arg Leu Arg Ser			
1175	1180	1185	
ttg tac gtg cct act cac gtt gac aga gtg act ctg att cca tcg			3609
Leu Tyr Val Pro Thr His Val Asp Arg Val Thr Leu Ile Pro Ser			
1190	1195	1200	
ctc tgt ata tcg gcg ggt aat tct ggt gaa acc gag ctt gcg ttt			3654
Leu Cys Ile Ser Ala Gly Asn Ser Gly Glu Thr Glu Leu Ala Phe			
1205	1210	1215	
gac aca atc aac aca cac gac aag ggt gat ttc ctg agc ggc gac			3699

Asp Thr Ile Asn Thr His Asp Lys Gly Asp Phe Leu Ser Gly Asp			
1220	1225	1230	
atc acg gtg tac gat tcg acc aag aca acg ctt ttc caa gtt gat			3744
Ile Thr Val Tyr Asp Ser Thr Lys Thr Thr Leu Phe Gln Val Asp			
1235	1240	1245	
aac att gtc ttt aag cct ttc tct ccc ccg act gct tcg acc gac			3789
Asn Ile Val Phe Lys Pro Phe Ser Pro Pro Thr Ala Ser Thr Asp			
1250	1255	1260	
cac cga atc ttc gca aag tgg gtc tgg gga ccc ctc acg ccc gaa			3834
His Arg Ile Phe Ala Lys Trp Val Trp Gly Pro Leu Thr Pro Glu			
1265	1270	1275	
aaa ctg ctg gag gac cct gcg acg ttg atc ata gct cgg gac aag			3879
Lys Leu Leu Glu Asp Pro Ala Thr Leu Ile Ile Ala Arg Asp Lys			
1280	1285	1290	
gag gac att ctg acc atc gag cga atc gtt tac ttc tac atc aaa			3924
Glu Asp Ile Leu Thr Ile Glu Arg Ile Val Tyr Phe Tyr Ile Lys			
1295	1300	1305	
tcc ttc cta gcc cag ata acc ccc gac gac cgt caa aat gcc gac			3969
Ser Phe Leu Ala Gln Ile Thr Pro Asp Asp Arg Gln Asn Ala Asp			
1310	1315	1320	
ctc cat tcc cag aag tac att gaa tgg tgt gac cag gtt cag gcc			4014
Leu His Ser Gln Lys Tyr Ile Glu Trp Cys Asp Gln Val Gln Ala			
1325	1330	1335	
gat gct cgg gct ggc cac cat cag tgg tac cag gag tct tgg gag			4059
Asp Ala Arg Ala Gly His His Gln Trp Tyr Gln Glu Ser Trp Glu			
1340	1345	1350	
gag gac act tct gtt cac att gag caa atg tgt gaa agc aac tcg			4104

Glu	Asp	Thr	Ser	Val	His	Ile	Glu	Gln	Met	Cys	Glu	Ser	Asn	Ser	
1355															1365
tcc	cac	cca	cat	gtg	cgc	ctg	atc	caa	agg	gta	ggc	aaa	gaa	tta	4149
Ser	His	Pro	His	Val	Arg	Leu	Ile	Gln	Arg	Val	Gly	Lys	Glu	Leu	
1370															1380
att	tca	att	gtt	cgc	ggg	aac	ggg	gat	cct	ttg	gat	atc	atg	aac	4194
Ile	Ser	Ile	Val	Arg	Gly	Asn	Gly	Asp	Pro	Leu	Asp	Ile	Met	Asn	
1385															1395
cgc	gat	ggg	ttg	ttc	acc	gag	tac	tat	acc	aac	aag	ctc	gcc	ttt	4239
Arg	Asp	Gly	Leu	Phe	Thr	Glu	Tyr	Tyr	Thr	Asn	Lys	Leu	Ala	Phe	
1400															1410
ggc	tca	gca	ata	cac	gtc	gtt	cag	gat	ctg	gtt	agc	caa	att	gct	4284
Gly	Ser	Ala	Ile	His	Val	Val	Gln	Asp	Leu	Val	Ser	Gln	Ile	Ala	
1415															1425
cat	cgc	tac	caa	tcc	att	gat	atc	ctt	gag	atc	ggc	ttg	ggt	aca	4329
His	Arg	Tyr	Gln	Ser	Ile	Asp	Ile	Leu	Glu	Ile	Gly	Leu	Gly	Thr	
1430															1440
ggc	atc	gcc	acg	aag	cgc	gtt	ctt	gca	tca	cct	caa	ctt	ggt	ttc	4374
Gly	Ile	Ala	Thr	Lys	Arg	Val	Leu	Ala	Ser	Pro	Gln	Leu	Gly	Phe	
1445															1455
aac	agt	tac	act	tgc	act	gac	atc	tcg	gcg	gat	gtt	att	ggc	aag	4419
Asn	Ser	Tyr	Thr	Cys	Thr	Asp	Ile	Ser	Ala	Asp	Val	Ile	Gly	Lys	
1460															1470
gcc	cgt	gaa	caa	ctt	tcc	gaa	ttc	gac	ggt	ctc	atg	cag	ttt	gag	4464
Ala	Arg	Glu	Gln	Leu	Ser	Glu	Phe	Asp	Gly	Leu	Met	Gln	Phe	Glu	
1475															1485
gca	cta	gac	atc	aac	aga	agc	cca	gca	gag	caa	gga	ttc	aag	cct	4509

Ala Leu Asp Ile Asn Arg Ser Pro Ala Glu Gln Gly Phe Lys Pro  
1490 1495 1500

cac tcc tac gat ctg att att gca tcc gat gtc ctc cat gcc agc 4554  
His Ser Tyr Asp Leu Ile Ile Ala Ser Asp Val Leu His Ala Ser  
1505 1510 1515

tcc aac ttc gag gaa aaa ttg gct cac ata agg tcc ttg ctc aag 4599  
Ser Asn Phe Glu Glu Lys Leu Ala His Ile Arg Ser Leu Leu Lys  
1520 1525 1530

ccg ggt ggt cac ttg gtt act ttc ggg gtc acc cat cgc gag cct 4644  
Pro Gly Gly His Leu Val Thr Phe Gly Val Thr His Arg Glu Pro  
1535 1540 1545

gct cgc ctc gcc ttc atc tct ggg ctt ttc gct gat cga tgg act 4689  
Ala Arg Leu Ala Phe Ile Ser Gly Leu Phe Ala Asp Arg Trp Thr  
1550 1555 1560

gga gaa gac gaa act cgt gct ttg agt gcc tcg ggg tcc gtt gac 4734  
Gly Glu Asp Glu Thr Arg Ala Leu Ser Ala Ser Gly Ser Val Asp  
1565 1570 1575

caa tgg gag cat acc ctc aag aga gtt ggg ttc tct ggc gtc gat 4779  
Gln Trp Glu His Thr Leu Lys Arg Val Gly Phe Ser Gly Val Asp  
1580 1585 1590

agt cgg aca ctt gat cga gag gat gat ttg atc ccg tct gtc ttc 4824  
Ser Arg Thr Leu Asp Arg Glu Asp Asp Leu Ile Pro Ser Val Phe  
1595 1600 1605

agt aca cat gct gtg gat gcc acc gtt gag cgt ttg tat gat cca 4869  
Ser Thr His Ala Val Asp Ala Thr Val Glu Arg Leu Tyr Asp Pro  
1610 1615 1620

ctt tct gct cca ttg aag gac tca tac ccg cca tta gtg gtt atc 4914

Leu Ser Ala Pro Leu Lys Asp Ser Tyr Pro Pro Leu Val Val Ile			
1625	1630	1635	
ggt ggc gaa tcg aca aaa acc gaa cgc att ttg aac gac atg aaa			4959
Gly Gly Glu Ser Thr Lys Thr Glu Arg Ile Leu Asn Asp Met Lys			
1640	1645	1650	
gct gcc cta ccg cat aga cac atc cac tcc gtc aag cgg ctg gaa			5004
Ala Ala Leu Pro His Arg His Ile His Ser Val Lys Arg Leu Glu			
1655	1660	1665	
agt gtt ctc gac gac ccg gcc ttg cag cct aag tcg act ttt gtc			5049
Ser Val Leu Asp Asp Pro Ala Leu Gln Pro Lys Ser Thr Phe Val			
1670	1675	1680	
atc ctc tcg gaa ctt gat gat gaa gtg ttt tgc aac ctt gaa gag			5094
Ile Leu Ser Glu Leu Asp Asp Glu Val Phe Cys Asn Leu Glu Glu			
1685	1690	1695	
gac aag ttt gag gca gtc aag tct ctt ctc ttc tac gcc gga cgc			5139
Asp Lys Phe Glu Ala Val Lys Ser Leu Leu Phe Tyr Ala Gly Arg			
1700	1705	1710	
atg atg tgg ctg aca gag aat gcc tgg att gat cat ccc cac cag			5184
Met Met Trp Leu Thr Glu Asn Ala Trp Ile Asp His Pro His Gln			
1715	1720	1725	
gcc agc acc atc gga atg ttg agg aca atc aag ctc gag aac cct			5229
Ala Ser Thr Ile Gly Met Leu Arg Thr Ile Lys Leu Glu Asn Pro			
1730	1735	1740	
gac ttg gga acg cac gtc ttc gat gtc gat act gtg gag aac cta			5274
Asp Leu Gly Thr His Val Phe Asp Val Asp Thr Val Glu Asn Leu			
1745	1750	1755	
gac acc aaa ttc ttc gtt gag caa ctt ttg cgc ttc gag gag agc			5319

Asp Thr Lys Phe Phe Val Glu Gln Leu Leu Arg Phe Glu Glu Ser			
1760	1765	1770	
gat gat cag ctt ttg gaa tca ata aca tgg act cat gag ccc gaa			5364
Asp Asp Gln Leu Leu Glu Ser Ile Thr Trp Thr His Glu Pro Glu			
1775	1780	1785	
gtg tac tgg tgc aag ggt cgt gcc tgg gtc cct cgt ttg aag cag			5409
Val Tyr Trp Cys Lys Gly Arg Ala Trp Val Pro Arg Leu Lys Gln			
1790	1795	1800	
gat att gct agg aac gac cgt atg aac tcg tct cgt cgt cca att			5454
Asp Ile Ala Arg Asn Asp Arg Met Asn Ser Ser Arg Arg Pro Ile			
1805	1810	1815	
ttc ggt aac ttt aat tcg tcc aag acg gcc att gca ctg aaa gag			5499
Phe Gly Asn Phe Asn Ser Ser Lys Thr Ala Ile Ala Leu Lys Glu			
1820	1825	1830	
gcg agg gga gca tcc tca tcg atg tac tat ctt gag tca acc gag			5544
Ala Arg Gly Ala Ser Ser Ser Met Tyr Tyr Leu Glu Ser Thr Glu			
1835	1840	1845	
acg tgt gat tcg tta gaa gac gct cgt cat gct gga aaa gca act			5589
Thr Cys Asp Ser Leu Glu Asp Ala Arg His Ala Gly Lys Ala Thr			
1850	1855	1860	
gtt cgt gtt cgc tac gct ctt ccc cag gca att cgc gtg ggc cat			5634
Val Arg Val Arg Tyr Ala Leu Pro Gln Ala Ile Arg Val Gly His			
1865	1870	1875	
ctc gga tac ttc cat gtc gtg cag ggc agt att ctg gag aat aca			5679
Leu Gly Tyr Phe His Val Val Gln Gly Ser Ile Leu Glu Asn Thr			
1880	1885	1890	
tgt gag gtg cct gta gtc gcc ctg gct gag aag aat gga tct ata			5724

Cys	Glu	Val	Pro	Val	Val	Ala	Leu	Ala	Glu	Lys	Asn	Gly	Ser	Ile	
1895		1900		1905											
ctg	cat	gta	ccg	aga	aac	tac	atg	cat	agt	ctg	ccc	gat	aac	atg	5769
Leu	His	Val	Pro	Arg	Asn	Tyr	Met	His	Ser	Leu	Pro	Asp	Asn	Met	
1910		1915		1920											
gcg	gaa	ggc	gag	gat	agt	tcc	ttc	ttg	ttc	aca	gct	gca	gcc		5814
Ala	Glu	Gly	Glu	Asp	Ser	Ser	Phe	Leu	Leu	Ser	Thr	Ala	Ala	Ala	
1925		1930		1935											
ctc	ctt	gcc	gaa	aca	att	ctc	tct	agc	gct	cag	tcc	ttt	ggc	tct	5859
Leu	Leu	Ala	Glu	Thr	Ile	Leu	Ser	Ser	Ala	Gln	Ser	Phe	Gly	Ser	
1940		1945		1950											
gat	gca	tca	att	ctg	att	atg	gag	ccc	cca	atc	ttc	tgc	gtc	aaa	5904
Asp	Ala	Ser	Ile	Leu	Ile	Met	Glu	Pro	Pro	Ile	Phe	Cys	Val	Lys	
1955		1960		1965											
gca	att	ctg	gag	tcg	gcc	aaa	acc	tac	ggt	gtt	cag	gtt	cat	ttg	5949
Ala	Ile	Leu	Glu	Ser	Ala	Lys	Thr	Tyr	Gly	Val	Gln	Val	His	Leu	
1970		1975		1980											
gca	aca	act	ctg	tcc	gac	gtc	aaa	act	att	ccg	gct	cct	tgg	atc	5994
Ala	Thr	Thr	Leu	Ser	Asp	Val	Lys	Thr	Ile	Pro	Ala	Pro	Trp	Ile	
1985		1990		1995											
cga	tta	cat	gcc	aag	gaa	acc	gac	gct	cggt	ctg	aaa	cac	agc	ctg	6039
Arg	Leu	His	Ala	Lys	Glu	Thr	Asp	Ala	Arg	Leu	Lys	His	Ser	Leu	
2000		2005		2010											
ccg	aca	aac	atg	atg	gca	ttc	ttt	gac	ttg	tct	acc	gac	cggt	act	6084
Pro	Thr	Asn	Met	Met	Ala	Phe	Phe	Asp	Leu	Ser	Thr	Asp	Arg	Thr	
2015		2020		2025											
gct	gcc	ggg	ata	acc	aac	cgt	ttg	gcc	aag	ttg	cta	cca	ccc	agt	6129

Ala Ala Gly Ile Thr Asn Arg	Leu Ala Lys Leu Leu	Pro Pro Ser	
2030	2035	2040	
tgc ttc atg tac agt ggt gac	tat ctt atc cga agt	aca gct tcc	6174
Cys Phe Met Tyr Ser Gly Asp	Tyr Leu Ile Arg Ser	Thr Ala Ser	
2045	2050	2055	
aca tac aaa gtt agt cat gtt	gag gat att cca atc	ctc gag cac	6219
Thr Tyr Lys Val Ser His Val	Glu Asp Ile Pro Ile	Leu Glu His	
2060	2065	2070	
tct gtg gca atg gca aaa aat	acc gtc tct gcg tcg	act gtc gac	6264
Ser Val Ala Met Ala Lys Asn	Thr Val Ser Ala Ser	Thr Val Asp	
2075	2080	2085	
gac act gag aaa gtt att aca	gcc aca caa att ctc	ttg cct ggt	6309
Asp Thr Glu Lys Val Ile Thr	Ala Thr Gln Ile Leu	Leu Pro Gly	
2090	2095	2100	
cag ctc tct gtc aac cac aat	gac caa cgc ttc aat	ctg gcc acc	6354
Gln Leu Ser Val Asn His Asn	Asp Gln Arg Phe Asn	Leu Ala Thr	
2105	2110	2115	
gtc atc gac tgg aag gaa aat	gag gtg tcc gct agg	att tgc ccc	6399
Val Ile Asp Trp Lys Glu Asn	Glu Val Ser Ala Arg	Ile Cys Pro	
2120	2125	2130	
atc gac tct ggt aac tta ttt	tcc aac aag aag acg	tat ttg ctt	6444
Ile Asp Ser Gly Asn Leu Phe	Ser Asn Lys Lys Thr	Tyr Leu Leu	
2135	2140	2145	
gtt ggt ctt acc ggg gac ctt	ggt cgc tct ctc tgt	cgc tgg atg	6489
Val Gly Leu Thr Gly Asp Leu	Gly Arg Ser Leu Cys	Arg Trp Met	
2150	2155	2160	
atc ttg cat ggc gcc cgc cat	gtt gtg ctc act agc	cgg aac cct	6534

Ile	Leu	His	Gly	Ala	Arg	His	Val	Val	Leu	Thr	Ser	Arg	Asn	Pro	
2165							2170					2175			
cga	ctt	gat	ccc	aaa	tgg	atc	gcc	aac	atg	gag	gca	ctt	ggt	ggt	6579
Arg	Leu		Asp	Pro	Lys	Trp	Ile	Ala	Asn	Met	Glu	Ala	Leu	Gly	Gly
2180							2185					2190			
gac	atc	acc	gtt	ctg	tca	atg	gat	gtt	gcc	aat	gag	gat	tca	gtc	6624
Asp	Ile		Thr	Val	Leu	Ser	Met	Asp	Val	Ala	Asn	Glu	Asp	Ser	Val
2195							2200					2205			
gat	gct	ggc	ctt	ggc	aag	ctt	gtc	gat	atg	aag	ttg	cca	cct	gtt	6669
Asp	Ala		Gly	Leu	Gly	Lys	Leu	Val	Asp	Met	Lys	Leu	Pro	Pro	Val
2210							2215					2220			
gcc	ggc	atc	gcg	ttc	ggg	cct	ttg	gtg	ctg	cag	gat	gtc	atg	ctg	6714
Ala	Gly	Ile	Ala	Phe	Gly	Pro	Leu	Val	Leu	Gln	Asp	Val	Met	Leu	
2225							2230					2235			
aag	aac	atg	gac	cac	cag	atg	atg	gac	atg	gtg	ttg	aag	ccc	aag	6759
Lys	Asn		Met	Asp	His	Gln	Met	Met	Asp	Met	Val	Leu	Lys	Pro	Lys
2240							2245					2250			
gta	caa	gga	gca	cgc	att	ctt	cat	gaa	cgg	ttc	tcc	gaa	cag	acg	6804
Val	Gln		Gly	Ala	Arg	Ile	Leu	His	Glu	Arg	Phe	Ser	Glu	Gln	Thr
2255							2260					2265			
ggc	agc	aag	gcg	ctc	gac	ttc	ttc	atc	atg	ttt	tcg	tcc	att	gtt	6849
Gly	Ser	Lys	Ala	Leu	Asp	Phe	Phe	Ile	Met	Phe	Ser	Ser	Ile	Val	
2270							2275					2280			
gca	gtt	att	ggc	aat	cct	ggc	cag	tcc	aac	tat	ggc	gct	gcg	aat	6894
Ala	Val	Ile	Gly	Asn	Pro	Gly	Gln	Ser	Asn	Tyr	Gly	Ala	Ala	Asn	
2285							2290					2295			
gcc	tac	cta	cag	gct	ctg	gcc	cag	caa	cgg	tgc	gcc	aga	gga	ttg	6939

Ala	Tyr	Leu	Gln	Ala	Leu	Ala	Gln	Gln	Arg	Cys	Ala	Arg	Gly	Leu	
2300				2305					2310						
gcg	gga	tca	acc	atc	gat	att	ggg	gcc	gtt	tac	ggt	gta	ggg	ttt	6984
Ala	Gly	Ser	Thr	Ile	Asp	Ile	Gly	Ala	Val	Tyr	Gly	Val	Gly	Phe	
2315				2320					2325						
gtc	acg	agg	gcc	gag	atg	gag	gag	gac	ttt	gat	gct	atc	cgt	ttc	7029
Val	Thr	Arg	Ala	Glu	Met	Glu	Glu	Asp	Phe	Asp	Ala	Ile	Arg	Phe	
2330				2335					2340						
atg	ttt	gac	tca	gtt	gaa	gag	cat	gag	ctg	cac	acg	ctt	ttc	gcc	7074
Met	Phe	Asp	Ser	Val	Glu	Glu	His	Glu	Leu	His	Thr	Leu	Phe	Ala	
2345				2350					2355						
gaa	gcg	gtc	gtg	tct	gac	cag	cgt	gcc	cgg	cag	caa	cca	cag	cgc	7119
Glu	Ala	Val	Val	Ser	Asp	Gln	Arg	Ala	Arg	Gln	Gln	Pro	Gln	Arg	
2360				2365					2370						
aag	acg	gtc	att	gac	atg	gcg	gac	ctt	gag	ctt	acc	acg	ggt	atc	7164
Lys	Thr	Val	Ile	Asp	Met	Ala	Asp	Leu	Glu	Leu	Thr	Thr	Gly	Ile	
2375				2380					2385						
cca	gat	ctt	gac	cct	gcg	ctt	caa	gat	cga	att	att	tac	ttc	aac	7209
Pro	Asp	Leu	Asp	Pro	Ala	Leu	Gln	Asp	Arg	Ile	Ile	Tyr	Phe	Asn	
2390				2395					2400						
gac	cct	cgi	ttc	gga	aac	ttc	aaa	att	ccc	ggt	caa	cgc	gga	gac	7254
Asp	Pro	Arg	Phe	Gly	Asn	Phe	Lys	Ile	Pro	Gly	Gln	Arg	Gly	Asp	
2405				2410					2415						
ggt	ggc	gac	aat	gga	tca	ggg	tct	aaa	ggc	tcc	att	gcc	gac	cag	7299
Gly	Gly	Asp	Asn	Gly	Ser	Gly	Ser	Lys	Gly	Ser	Ile	Ala	Asp	Gln	
2420				2425					2430						
ctc	aaa	caa	gca	aca	act	tta	gac	caa	gtt	cgg	caa	atc	gtg	att	7344

Leu Lys Gln Ala Thr Thr Leu Asp Gln Val Arg Gln Ile Val Ile  
2435 2440 2445

gat ggt cta tct gag aaa ctc cgt gtt acc ctc caa gtt tcg gac 7389  
Asp Gly Leu Ser Glu Lys Leu Arg Val Thr Leu Gln Val Ser Asp  
2450 2455 2460

ggg gag agc gtg gac cca acc att cct ctc att gat caa ggt gtc 7434  
Gly Glu Ser Val Asp Pro Thr Ile Pro Leu Ile Asp Gln Gly Val  
2465 2470 2475

gac tcc ttg ggt gca gtg act gtc ggc tca tgg ttc tca aag caa 7479  
Asp Ser Leu Gly Ala Val Thr Val Gly Ser Trp Phe Ser Lys Gln  
2480 2485 2490

ctc tac ctt gac ctc cca ctc ttg agg gta ctt ggc ggt gct tct 7524  
Leu Tyr Leu Asp Leu Pro Leu Leu Arg Val Leu Gly Gly Ala Ser  
2495 2500 2505

gtc gct gat ctt gcc gac gac gcg gcc acc cga ctc cca gct aca 7569  
Val Ala Asp Leu Ala Asp Asp Ala Ala Thr Arg Leu Pro Ala Thr  
2510 2515 2520

tcc att ccg ctg ctg ttg caa att ggt gat tcc acg gga acc tcg 7614  
Ser Ile Pro Leu Leu Leu Gln Ile Gly Asp Ser Thr Gly Thr Ser  
2525 2530 2535

gac agc ggg gct tct ccg aca cca aca gac agc cat gat gaa gca 7659  
Asp Ser Gly Ala Ser Pro Thr Pro Thr Asp Ser His Asp Glu Ala  
2540 2545 2550

agc tct gct acc agc aca gat gcg tcg tca gcc gaa gag gat gaa 7704  
Ser Ser Ala Thr Ser Thr Asp Ala Ser Ser Ala Glu Glu Asp Glu  
2555 2560 2565

gag caa gag gac gat aat gag cag gga ggc cgt aag att ctt cgt 7749

Glu	Gln	Glu	Asp	Asp	Asn	Glu	Gln	Gly	Gly	Arg	Lys	Ile	Leu	Arg	
2570		2575				2580									
cgc	gag	agg	ttg	tcc	ctt	ggc	cag	gag	tat	tcc	tgg	agg	cag	caa	7794
Arg	Glu	Arg	Leu	Ser	Leu	Gly	Gln	Glu	Tyr	Ser	Trp	Arg	Gln	Gln	
2585		2590				2595									
caa	atg	gta	aaa	gat	cat	acc	atc	ttc	aac	aac	act	att	ggc	atg	7839
Gln	Met	Val	Lys	Asp	His	Thr	Ile	Phe	Asn	Asn	Thr	Ile	Gly	Met	
2600		2605				2610									
ttc	atg	aag	ggt	acc	att	gac	ctc	gac	cgg	ttg	agg	cgg	gct	ctg	7884
Phe	Met	Lys	Gly	Thr	Ile	Asp	Leu	Asp	Arg	Leu	Arg	Arg	Ala	Leu	
2615		2620			2625										
aaa	gcc	tca	ttg	cgc	cgt	cac	gag	atc	ttc	cgt	acg	tgc	ttt	gtt	7929
Lys	Ala	Ser	Leu	Arg	Arg	His	Glu	Ile	Phe	Arg	Thr	Cys	Phe	Val	
2630		2635			2640										
act	ggc	gat	gac	tat	agc	agc	gat	tta	aat	ggt	ccc	gtc	caa	gtg	7974
Thr	Gly	Asp	Asp	Tyr	Ser	Ser	Asp	Leu	Asn	Gly	Pro	Val	Gln	Val	
2645		2650			2655										
gtt	ctc	aag	aac	ccg	gag	aac	aga	gtg	cac	ttt	gtt	cag	gtg	aac	8019
Val	Leu	Lys	Asn	Pro	Glu	Asn	Arg	Val	His	Phe	Val	Gln	Val	Asn	
2660		2665			2670										
aac	gct	gcg	gag	gca	gag	gaa	gag	tac	cgg	aaa	ctc	gag	aag	aca	8064
Asn	Ala	Ala	Glu	Ala	Glu	Glu	Glu	Tyr	Arg	Lys	Leu	Glu	Lys	Thr	
2675		2680			2685										
aac	tat	agc	atc	tcc	aca	ggt	gac	act	ctc	aga	ctc	gtt	gat	ttc	8109
Asn	Tyr	Ser	Ile	Ser	Thr	Gly	Asp	Thr	Leu	Arg	Leu	Val	Asp	Phe	
2690		2695			2700										
tac	tgg	ggc	aca	gat	gac	cac	ctg	ttg	gta	atc	ggc	tac	cac	aga	8154

Tyr Trp Gly Thr Asp Asp His Leu Leu Val Ile Gly Tyr His Arg  
2705 2710 2715

tta gtt ggt gat ggc tca aca aca gaa aac ctg ttc aat gag atc 8199  
Leu Val Gly Asp Gly Ser Thr Thr Glu Asn Leu Phe Asn Glu Ile  
2720 2725 2730

ggg cag att tac agc ggg gtg aaa atg cag cga cca tcg acc caa 8244  
Gly Gln Ile Tyr Ser Gly Val Lys Met Gln Arg Pro Ser Thr Gln  
2735 2740 2745

ttc tct gat cta gcc gtc caa cag cgg gaa aac ctg gaa aat ggg 8289  
Phe Ser Asp Leu Ala Val Gln Gln Arg Glu Asn Leu Glu Asn Gly  
2750 2755 2760

cga atg ggg gac gat atc gtc ttc tgg aag tcc atg cat agc aaa 8334  
Arg Met Gly Asp Asp Ile Ala Phe Trp Lys Ser Met His Ser Lys  
2765 2770 2775

gtc tcg tca tct gcg cca acc gtg ctt ccc atc atg aat ctg atc 8379  
Val Ser Ser Ser Ala Pro Thr Val Leu Pro Ile Met Asn Leu Ile  
2780 2785 2790

aat gac cct gct gcc aat tca gag cag cag caa ata cag cca ttc 8424  
Asn Asp Pro Ala Ala Asn Ser Glu Gln Gln Gln Ile Gln Pro Phe  
2795 2800 2805

acg tgg cag cag tat gaa gca att gct cgt tta gat ccc atg gtc 8469  
Thr Trp Gln Gln Tyr Glu Ala Ile Ala Arg Leu Asp Pro Met Val  
2810 2815 2820

gcc ttc cga atc aaa gag cgg agc cgc aag cac aag gca acc ccc 8514  
Ala Phe Arg Ile Lys Glu Arg Ser Arg Lys His Lys Ala Thr Pro  
2825 2830 2835

atg cag ttc tac ctg gcc gcc tac cac gtt ttg ttg gcg cgt ctt 8559

Met Gln Phe Tyr Leu Ala Ala	Tyr His Val Leu Leu	Ala Arg Leu	
2840	2845	2850	
acc ggc agc aaa gac ata acc	atc ggc ctc gcc gaa	acc aac cga	8604
Thr Gly Ser Lys Asp Ile Thr	Ile Gly Leu Ala Glu	Thr Asn Arg	
2855	2860	2865	
tcc acc atg gaa gaa att tcg	gcg atg ggc ttt ttc	gct aac gtg	8649
Ser Thr Met Glu Glu Ile Ser	Ala Met Gly Phe Phe	Ala Asn Val	
2870	2875	2880	
ctt ccc ctg cgc ttt gat gag	ttt gtc ggc agc aag	aca ttc ggc	8694
Leu Pro Leu Arg Phe Asp Glu	Phe Val Gly Ser Lys	Thr Phe Gly	
2885	2890	2895	
gag cac ctt gta gcc acc aag	gac agt gtg cgt gag	gcc atg caa	8739
Glu His Leu Val Ala Thr Lys	Asp Ser Val Arg Glu	Ala Met Gln	
2900	2905	2910	
cac gcg cggtt ccgttat ggc	gtc atc ctc gac tgt	cta ggc ctg	8784
His Ala Arg Val Pro Tyr Gly	Val Ile Leu Asp Cys	Leu Gly Leu	
2915	2920	2925	
aat ctc cct acc tca ggc gag	gaa ccc aag act cag	aca cac gcc	8829
Asn Leu Pro Thr Ser Gly Glu	Glu Pro Lys Thr Gln	Thr His Ala	
2930	2935	2940	
ccc ttg ttc cag gct gtc ttt	gat tac aag cag ggt	caa gcg gag	8874
Pro Leu Phe Gln Ala Val Phe	Asp Tyr Lys Gln Gly	Gln Ala Glu	
2945	2950	2955	
agt ggc tca att ggc aat gcc	aaa atg acg agt gtt	ctc gct tcc	8919
Ser Gly Ser Ile Gly Asn Ala	Lys Met Thr Ser Val	Leu Ala Ser	
2960	2965	2970	
cgt gag cgc act cct tat gac	atc gtt ctc gag atg	tgg gat gac	8964

Arg Glu Arg Thr Pro Tyr Asp Ile Val Leu Glu Met Trp Asp Asp  
2975 2980 2985

cct acc aag gac cca ctc att cat gtc aaa ctt cag agc tcg ctg 9009  
Pro Thr Lys Asp Pro Leu Ile His Val Lys Leu Gln Ser Ser Leu  
2990 2995 3000

tat ggc cct gag cac gct cag gcc ttt gta gac cac ttt tct tca 9054  
Tyr Gly Pro Glu His Ala Gln Ala Phe Val Asp His Phe Ser Ser  
3005 3010 3015

atc ctc act atg ttc tcg atg aac ccg gct ctg aag ttg gcc tag 9099  
Ile Leu Thr Met Phe Ser Met Asl Pro Ala Leu Lys Leu Ala  
3020 3025 3030

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<212> PRT  
<213> Penicillium citrinum

<400> 44

Met Asp Gln Ala Asn Tyr Pro Asn Glu Pro Ile Val Val Val Gly Ser  
1 5 10 15

Gly Cys Arg Phe Pro Gly Gly Val Asn Thr Pro Ser Lys Leu Trp Glu  
20 25 30

Leu Leu Lys Glu Pro Arg Asp Val Gln Thr Lys Ile Pro Lys Glu Arg  
35 40 45

Phe Asp Val Asp Thr Phe Tyr Ser Pro Asp Gly Thr His Pro Gly Arg

50                    55                    60

Thr Asn Ala Pro Phe Ala Tyr Leu Leu Gln Glu Asp Leu Arg Gly Phe  
65                    70                    75                    80

Asp Ala Ser Phe Phe Asn Ile Gln Ala Gly Glu Ala Glu Thr Ile Asp  
85                    90                    95

Pro Gln Gln Arg Leu Leu Leu Glu Thr Val Tyr Glu Ala Val Ser Asn  
100                  105                  110

Ala Gly Leu Arg Ile Gln Gly Leu Gln Gly Ser Ser Thr Ala Val Tyr  
115                  120                  125

Val Gly Met Met Thr His Asp Tyr Glu Thr Ile Val Thr Arg Glu Leu  
130                  135                  140

Asp Ser Ile Pro Thr Tyr Ser Ala Thr Gly Val Ala Val Ser Val Ala  
145                  150                  155                  160

Ser Asn Arg Val Ser Tyr Phe Phe Asp Trp His Gly Pro Ser Met Thr  
165                  170                  175

Ile Asp Thr Ala Cys Ser Ser Leu Ala Ala Val His Leu Ala Val  
180                  185                  190

Gln Gln Leu Arg Thr Gly Glu Ser Thr Met Ala Val Ala Ala Gly Ala

195

200

205

Asn Leu Ile Leu Gly Pro Met Thr Phe Val Met Glu Ser Lys Leu Asn

210

215

220

Met Leu Ser Pro Asn Gly Arg Ser Arg Met Trp Asp Ala Ala Ala Asp

225

230

235

240

Gly Tyr Ala Arg Gly Glu Gly Val Cys Ser Ile Val Leu Lys Thr Leu

245

250

255

Ser Gln Ala Leu Arg Asp Gly Asp Ser Ile Glu Cys Val Ile Arg Glu

260

265

270

Thr Gly Ile Asn Gln Asp Gly Arg Thr Thr Gly Ile Thr Met Pro Asn

275

280

285

His Ser Ala Gln Glu Ala Leu Ile Arg Ala Thr Tyr Ala Lys Ala Gly

290

295

300

Leu Asp Ile Thr Asn Pro Gln Glu Arg Cys Gln Phe Phe Glu Ala His

305

310

315

320

Gly Thr Gly Thr Pro Ala Gly Asp Pro Gln Glu Ala Glu Ala Ile Ala

325

330

335

Thr Ala Phe Phe Gly His Lys Asp Gly Thr Ile Asp Ser Asp Gly Glu

340 345 350

Lys Asp Glu Leu Phe Val Gly Ser Ile Lys Thr Val Leu Gly His Thr  
355 360 365

Glu Gly Thr Ala Gly Ile Ala Gly Leu Met Lys Ala Ser Phe Ala Val  
370 375 380

Arg Asn Gly Val Ile Pro Pro Asn Leu Leu Phe Glu Lys Ile Ser Pro  
385 390 395 400

Arg Val Ala Pro Phe Tyr Thr His Leu Lys Ile Ala Thr Glu Ala Thr  
405 410 415

Glu Trp Pro Ile Val Ala Pro Gly Gln Pro Arg Arg Val Ser Val Asn  
420 425 430

Ser Phe Gly Phe Gly Gly Thr Asn Ala His Ala Ile Ile Glu Glu Tyr  
435 440 445

Met Ala Pro Pro His Lys Pro Thr Ala Val Val Thr Glu Val Thr Ser  
450 455 460

Asp Ala Asp Ala Cys Ser Leu Pro Leu Val Leu Ser Ser Lys Ser Gln  
465 470 475 480

Arg Ser Met Lys Ala Thr Leu Glu Asn Met Leu Gln Phe Leu Glu Thr

485 490 495

His Asp Asp Val Asp Met His Asp Ile Ala Tyr Thr Leu Leu Glu Lys  
500 505 510

Arg Ser Ile Leu Pro Phe Arg Arg Ala Ile Ala Ala His Asn Lys Glu  
515 520 525

Val Ala Arg Ala Ala Leu Glu Ala Ala Ile Ala Asp Gly Glu Val Val  
530 535 540

Thr Asp Phe Arg Thr Asp Ala Asn Asp Asn Pro Arg Val Leu Gly Val  
545 550 555 560

Phe Thr Gly Gln Gly Ala Gln Trp Pro Gly Met Leu Lys Lys Leu Met  
565 570 575

Val Gly Met Pro Phe Val Arg Gly Ile Leu Glu Glu Leu Asp Asn Ser  
580 585 590

Leu Gln Thr Leu Pro Glu Lys Tyr Arg Pro Thr Trp Thr Leu Tyr Asp  
595 600 605

Gln Leu Met Leu Glu Gly Asp Ala Ser Asn Val Arg Leu Ala Ser Phe  
610 615 620

Ser Gln Pro Leu Cys Cys Ala Val Gln Ile Val Leu Val Arg Leu Leu

625                    630                    635                    640

Ala Ala Ala Gly Ile Glu Phe Ser Ala Ile Val Gly His Ser Ser Gly  
645                    650                    655

Glu Ile Ala Cys Ala Phe Ala Ala Gly Phe Ile Ser Ala Thr Gln Ala  
660                    665                    670

Ile Arg Ile Ala His Leu Arg Gly Val Val Ser Ala Glu His Ala Ser  
675                    680                    685

Ser Pro Ser Gly Gln Thr Gly Ala Met Leu Ala Ala Gly Met Ser Tyr  
690                    695                    700

Asp Asp Ala Lys Glu Leu Cys Glu Ieu Glu Ala Phe Glu Gly Arg Val  
705                    710                    715                    720

Cys Val Ala Ala Ser Asn Ser Pro Asp Ser Val Thr Phe Ser Gly Asp  
725                    730                    735

Met Asp Ala Ile Gln His Val Glu Gly Val Leu Glu Asp Glu Ser Thr  
740                    745                    750

Phe Ala Arg Ile Leu Arg Val Asp Lys Ala Tyr His Ser His His Met  
755                    760                    765

His Pro Cys Ala Ala Pro Tyr Val Lys Ala Leu Leu Glu Cys Asp Cys

770                    775                    780

Ala Val Ala Asp Gly Gln Gly Asn Asp Ser Val Ala Trp Phe Ser Ala  
785                    790                    795                    800

Val His Glu Thr Ser Lys Gln Met Tyr Val Gln Asp Val Met Pro Ala  
805                    810                    815

Tyr Trp Lys Asp Asn Leu Val Ser Pro Val Leu Phe Ser Gln Ala Val  
820                    825                    830

Gln Lys Ala Val Ile Thr His Arg Leu Ile Asp Val Ala Ile Glu Ile  
835                    840                    845

Gly Ala His Pro Ala Leu Lys Gly Pro Cys Leu Ala Thr Ile Lys Asp  
850                    855                    860

Ala Leu Ala Gly Val Glu Leu Pro Tyr Thr Gly Cys Leu Ala Arg Asn  
865                    870                    875                    880

Val Asp Asp Val Asp Ala Phe Ala Gly Gly Leu Gly Tyr Ile Trp Glu  
885                    890                    895

Arg Phe Gly Val Arg Ser Ile Asp Ala Glu Gly Phe Val Gln Gln Val  
900                    905                    910

Arg Pro Asp Arg Ala Val Gln Asn Leu Ser Lys Ser Leu Pro Thr Tyr

915

920

925

Ser Trp Asp His Thr Arg Gln Tyr Trp Ala Glu Ser Arg Ser Thr Arg

930

935

940

Gln His Leu Arg Gly Gly Ala Pro His Leu Leu Gly Lys Leu Ser

945

950

955

960

Ser Tyr Ser Thr Ala Ser Thr Phe Gln Trp Thr Asn Phe Ile Arg Pro

965

970

975

Arg Asp Leu Glu Trp Leu Asp Gly His Ala Leu Gln Gly Gln Thr Val

980

985

990

Phe Pro Ala Ala Gly Tyr Ile Ile Met Ala Met Glu Ala Ala Met Lys

995

1000

1005

Val Ala Gly Glu Arg Ala Ala Gln Val Gln Leu Leu Glu Ile Leu

1010

1015

1020

Asp Met Ser Ile Asn Lys Ala Ile Val Phe Glu Asp Glu Asn Thr

1025

1030

1035

Ser Val Glu Leu Asn Leu Thr Ala Glu Val Thr Ser Asp Asn Asp

1040

1045

1050

Ala Asp Gly Gln Val Thr Val Lys Phe Val Ile Asp Ser Cys Leu

1055                    1060                    1065

Ala Lys Glu Ser Glu Leu Ser Thr Ser Ala Lys Gly Gln Ile Val  
1070                    1075                    1080

Ile Thr Leu Gly Glu Ala Ser Pro Ser Ser Gln Leu Leu Pro Pro  
1085                    1090                    1095

Pro Glu Glu Glu Tyr Pro Gln Met Asn Asn Val Asn Ile Asp Phe  
1100                    1105                    1110

Phe Tyr Arg Glu Leu Asp Leu Leu Gly Tyr Asp Tyr Ser Lys Asp  
1115                    1120                    1125

Phe Arg Arg Leu Gln Thr Met Arg Arg Ala Asp Ser Lys Ala Ser  
1130                    1135                    1140

Gly Thr Leu Ala Phe Leu Pro Leu Lys Asp Glu Leu Arg Asn Glu  
1145                    1150                    1155

Pro Leu Leu Leu His Pro Ala Pro Leu Asp Ile Ala Phe Gln Thr  
1160                    1165                    1170

Val Ile Gly Ala Tyr Ser Ser Pro Gly Asp Arg Arg Leu Arg Ser  
1175                    1180                    1185

Leu Tyr Val Pro Thr His Val Asp Arg Val Thr Leu Ile Pro Ser

1190 1195 1200

Leu Cys Ile Ser Ala Gly Asn Ser Gly Glu Thr Glu Leu Ala Phe  
1205 1210 1215

Asp Thr Ile Asn Thr His Asp Lys Gly Asp Phe Leu Ser Gly Asp  
1220 1225 1230

Ile Thr Val Tyr Asp Ser Thr Lys Thr Thr Leu Phe Gln Val Asp  
1235 1240 1245

Asn Ile Val Phe Lys Pro Phe Ser Pro Pro Thr Ala Ser Thr Asp  
1250 1255 1260

His Arg Ile Phe Ala Lys Trp Val Trp Gly Pro Leu Thr Pro Glu  
1265 1270 1275

Lys Leu Leu Glu Asp Pro Ala Thr Leu Ile Ile Ala Arg Asp Lys  
1280 1285 1290

Glu Asp Ile Leu Thr Ile Glu Arg Ile Val Tyr Phe Tyr Ile Lys  
1295 1300 1305

Ser Phe Leu Ala Gln Ile Thr Pro Asp Asp Arg Gln Asn Ala Asp  
1310 1315 1320

Leu His Ser Gln Lys Tyr Ile Glu Trp Cys Asp Gln Val Gln Ala

1325                    1330                    1335

Asp Ala Arg Ala Gly His His Gln Trp Tyr Gln Glu Ser Trp Glu  
1340                    1345                    1350

Glu Asp Thr Ser Val His Ile Glu Gln Met Cys Glu Ser Asn Ser  
1355                    1360                    1365

Ser His Pro His Val Arg Leu Ile Gln Arg Val Gly Lys Glu Leu  
1370                    1375                    1380

Ile Ser Ile Val Arg Gly Asn Gly Asp Pro Leu Asp Ile Met Asn  
1385                    1390                    1395

Arg Asp Gly Leu Phe Thr Glu Tyr Tyr Thr Asn Lys Leu Ala Phe  
1400                    1405                    1410

Gly Ser Ala Ile His Val Val Gln Asp Leu Val Ser Gln Ile Ala  
1415                    1420                    1425

His Arg Tyr Gln Ser Ile Asp Ile Leu Glu Ile Gly Leu Gly Thr  
1430                    1435                    1440

Gly Ile Ala Thr Lys Arg Val Leu Ala Ser Pro Gln Leu Gly Phe  
1445                    1450                    1455

Asn Ser Tyr Thr Cys Thr Asp Ile Ser Ala Asp Val Ile Gly Lys

1460                    1465                    1470

Ala Arg Glu Gln Leu Ser Glu Phe Asp Gly Leu Met Gln Phe Glu  
1475                    1480                    1485

Ala Leu Asp Ile Asn Arg Ser Pro Ala Glu Gln Gly Phe Lys Pro  
1490                    1495                    1500

His Ser Tyr Asp Leu Ile Ile Ala Ser Asp Val Leu His Ala Ser  
1505                    1510                    1515

Ser Asn Phe Glu Glu Lys Leu Ala His Ile Arg Ser Leu Leu Lys  
1520                    1525                    1530

Pro Gly Gly His Leu Val Thr Phe Gly Val Thr His Arg Glu Pro  
1535                    1540                    1545

Ala Arg Leu Ala Phe Ile Ser Gly Leu Phe Ala Asp Arg Trp Thr  
1550                    1555                    1560

Gly Glu Asp Glu Thr Arg Ala Leu Ser Ala Ser Gly Ser Val Asp  
1565                    1570                    1575

Gln Trp Glu His Thr Leu Lys Arg Val Gly Phe Ser Gly Val Asp  
1580                    1585                    1590

Ser Arg Thr Leu Asp Arg Glu Asp Asp Leu Ile Pro Ser Val Phe

1595

1600

1605

Ser Thr His Ala Val Asp Ala Thr Val Glu Arg Leu Tyr Asp Pro  
1610 1615 1620

Leu Ser Ala Pro Leu Lys Asp Ser Tyr Pro Pro Leu Val Val Ile  
1625 1630 1635

Gly Gly Glu Ser Thr Lys Thr Glu Arg Ile Leu Asn Asp Met Lys  
1640 1645 1650

Ala Ala Leu Pro His Arg His Ile His Ser Val Lys Arg Leu Glu  
1655 1660 1665

Ser Val Leu Asp Asp Pro Ala Leu Gln Pro Lys Ser Thr Phe Val  
1670 1675 1680

Ile Leu Ser Glu Leu Asp Asp Glu Val Phe Cys Asn Leu Glu Glu  
1685 1690 1695

Asp Lys Phe Glu Ala Val Lys Ser Leu Leu Phe Tyr Ala Gly Arg  
1700 1705 1710

Met Met Trp Leu Thr Glu Asn Ala Trp Ile Asp His Pro His Gln  
1715 1720 1725

Ala Ser Thr Ile Gly Met Leu Arg Thr Ile Lys Leu Glu Asn Pro

1730                    1735                    1740

Asp Leu Gly Thr His Val Phe Asp Val Asp Thr Val Glu Asn Leu  
1745                    1750                    1755

Asp Thr Lys Phe Phe Val Glu Gln Leu Leu Arg Phe Glu Glu Ser  
1760                    1765                    1770

Asp Asp Gln Leu Leu Glu Ser Ile Thr Trp Thr His Glu Pro Glu  
1775                    1780                    1785

Val Tyr Trp Cys Lys Gly Arg Ala Trp Val Pro Arg Leu Lys Gln  
1790                    1795                    1800

Asp Ile Ala Arg Asn Asp Arg Met Asn Ser Ser Arg Arg Pro Ile  
1805                    1810                    1815

Phe Gly Asn Phe Asn Ser Ser Lys Thr Ala Ile Ala Leu Lys Glu  
1820                    1825                    1830

Ala Arg Gly Ala Ser Ser Ser Met Tyr Tyr Leu Glu Ser Thr Glu  
1835                    1840                    1845

Thr Cys Asp Ser Leu Glu Asp Ala Arg His Ala Gly Lys Ala Thr  
1850                    1855                    1860

Val Arg Val Arg Tyr Ala Leu Pro Gln Ala Ile Arg Val Gly His

1865                    1870                    1875

Leu Gly Tyr Phe His Val Val Gln Gly Ser Ile Leu Glu Asn Thr  
1880                    1885                    1890

Cys Glu Val Pro Val Val Ala Leu Ala Glu Lys Asn Gly Ser Ile  
1895                    1900                    1905

Leu His Val Pro Arg Asn Tyr Met His Ser Leu Pro Asp Asn Met  
1910                    1915                    1920

Ala Glu Gly Glu Asp Ser Ser Phe Leu Leu Ser Thr Ala Ala Ala  
1925                    1930                    1935

Leu Leu Ala Glu Thr Ile Leu Ser Ser Ala Gln Ser Phe Gly Ser  
1940                    1945                    1950

Asp Ala Ser Ile Leu Ile Met Glu Pro Pro Ile Phe Cys Val Lys  
1955                    1960                    1965

Ala Ile Leu Glu Ser Ala Lys Thr Tyr Gly Val Gln Val His Leu  
1970                    1975                    1980

Ala Thr Thr Leu Ser Asp Val Lys Thr Ile Pro Ala Pro Trp Ile  
1985                    1990                    1995

Arg Leu His Ala Lys Glu Thr Asp Ala Arg Leu Lys His Ser Leu

2000

2005

2010

Pro Thr Asn Met Met Ala Phe Phe Asp Leu Ser Thr Asp Arg Thr  
2015 2020 2025

Ala Ala Gly Ile Thr Asn Arg Leu Ala Lys Leu Leu Pro Pro Ser  
2030 2035 2040

Cys Phe Met Tyr Ser Gly Asp Tyr Leu Ile Arg Ser Thr Ala Ser  
2045 2050 2055

Thr Tyr Lys Val Ser His Val Glu Asp Ile Pro Ile Leu Glu His  
2060 2065 2070

Ser Val Ala Met Ala Lys Asn Thr Val Ser Ala Ser Thr Val Asp  
2075 2080 2085

Asp Thr Glu Lys Val Ile Thr Ala Thr Gln Ile Leu Leu Pro Gly  
2090 2095 2100

Gln Leu Ser Val Asn His Asn Asp Gln Arg Phe Asn Leu Ala Thr  
2105 2110 2115

Val Ile Asp Trp Lys Glu Asn Glu Val Ser Ala Arg Ile Cys Pro  
2120 2125 2130

Ile Asp Ser Gly Asn Leu Phe Ser Asn Lys Lys Thr Tyr Leu Leu

2135                    2140                    2145

Val Gly Leu Thr Gly Asp Leu Gly Arg Ser Leu Cys Arg Trp Met  
2150                    2155                    2160

Ile Leu His Gly Ala Arg His Val Val Leu Thr Ser Arg Asn Pro  
2165                    2170                    2175

Arg Leu Asp Pro Lys Trp Ile Ala Asn Met Glu Ala Leu Gly Gly  
2180                    2185                    2190

Asp Ile Thr Val Leu Ser Met Asp Val Ala Asn Glu Asp Ser Val  
2195                    2200                    2205

Asp Ala Gly Leu Gly Lys Leu Val Asp Met Lys Leu Pro Pro Val  
2210                    2215                    2220

Ala Gly Ile Ala Phe Gly Pro Leu Val Leu Gln Asp Val Met Leu  
2225                    2230                    2235

Lys Asn Met Asp His Gln Met Met Asp Met Val Leu Lys Pro Lys  
2240                    2245                    2250

Val Gln Gly Ala Arg Ile Leu His Glu Arg Phe Ser Glu Gln Thr  
2255                    2260                    2265

Gly Ser Lys Ala Leu Asp Phe Phe Ile Met Phe Ser Ser Ile Val

2270                  2275                  2280

Ala Val Ile Gly Asn Pro Gly Gln Ser Asn Tyr Gly Ala Ala Asn  
2285                  2290                  2295

Ala Tyr Leu Gln Ala Leu Ala Gln Gln Arg Cys Ala Arg Gly Leu  
2300                  2305                  2310

Ala Gly Ser Thr Ile Asp Ile Gly Ala Val Tyr Gly Val Gly Phe  
2315                  2320                  2325

Val Thr Arg Ala Glu Met Glu Glu Asp Phe Asp Ala Ile Arg Phe  
2330                  2335                  2340

Met Phe Asp Ser Val Glu Glu His Glu Leu His Thr Leu Phe Ala  
2345                  2350                  2355

Glu Ala Val Val Ser Asp Gln Arg Ala Arg Gln Gln Pro Gln Arg  
2360                  2365                  2370

Lys Thr Val Ile Asp Met Ala Asp Leu Glu Leu Thr Thr Gly Ile  
2375                  2380                  2385

Pro Asp Leu Asp Pro Ala Leu Gln Asp Arg Ile Ile Tyr Phe Asn  
2390                  2395                  2400

Asp Pro Arg Phe Gly Asn Phe Lys Ile Pro Gly Gln Arg Gly Asp

2405

2410

2415

Gly Gly Asp Asn Gly Ser Gly Ser Lys Gly Ser Ile Ala Asp Gln  
2420 2425 2430

Leu Lys Gln Ala Thr Thr Leu Asp Gln Val Arg Gln Ile Val Ile  
2435 2440 2445

Asp Gly Leu Ser Glu Lys Leu Arg Val Thr Leu Gln Val Ser Asp  
2450 2455 2460

Gly Glu Ser Val Asp Pro Thr Ile Pro Leu Ile Asp Gln Gly Val  
2465 2470 2475

Asp Ser Leu Gly Ala Val Thr Val Gly Ser Trp Phe Ser Lys Gln  
2480 2485 2490

Leu Tyr Leu Asp Leu Pro Leu Leu Arg Val Leu Gly Gly Ala Ser  
2495 2500 2505

Val Ala Asp Leu Ala Asp Asp Ala Ala Thr Arg Leu Pro Ala Thr  
2510 2515 2520

Ser Ile Pro Leu Leu Leu Gln Ile Gly Asp Ser Thr Gly Thr Ser  
2525 2530 2535

Asp Ser Gly Ala Ser Pro Thr Pro Thr Asp Ser His Asp Glu Ala

2540                  2545                  2550

Ser Ser Ala Thr Ser Thr Asp Ala Ser Ser Ala Glu Glu Asp Glu  
2555                  2560                  2565

Glu Gln Glu Asp Asp Asn Glu Gln Gly Gly Arg Lys Ile Leu Arg  
2570                  2575                  2580

Arg Glu Arg Leu Ser Leu Gly Gln Glu Tyr Ser Trp Arg Gln Gln  
2585                  2590                  2595

Gln Met Val Lys Asp His Thr Ile Phe Asn Asn Thr Ile Gly Met  
2600                  2605                  2610

Phe Met Lys Gly Thr Ile Asp Leu Asp Arg Leu Arg Arg Ala Leu  
2615                  2620                  2625

Lys Ala Ser Leu Arg Arg His Glu Ile Phe Arg Thr Cys Phe Val  
2630                  2635                  2640

Thr Gly Asp Asp Tyr Ser Ser Asp Leu Asn Gly Pro Val Gln Val  
2645                  2650                  2655

Val Leu Lys Asn Pro Glu Asn Arg Val His Phe Val Gln Val Asn  
2660                  2665                  2670

Asn Ala Ala Glu Ala Glu Glu Glu Tyr Arg Lys Leu Glu Lys Thr

2675                    2680                    2685

Asn Tyr Ser Ile Ser Thr Gly Asp Thr Leu Arg Leu Val Asp Phe  
2690                    2695                    2700

Tyr Trp Gly Thr Asp Asp His Leu Leu Val Ile Gly Tyr His Arg  
2705                    2710                    2715

Leu Val Gly Asp Gly Ser Thr Thr Glu Asn Leu Phe Asn Glu Ile  
2720                    2725                    2730

Gly Gln Ile Tyr Ser Gly Val Lys Met Gln Arg Pro Ser Thr Gln  
2735                    2740                    2745

Phe Ser Asp Leu Ala Val Gln Gln Arg Glu Asn Leu Glu Asn Gly  
2750                    2755                    2760

Arg Met Gly Asp Asp Ile Ala Phe Trp Lys Ser Met His Ser Lys  
2765                    2770                    2775

Val Ser Ser Ser Ala Pro Thr Val Leu Pro Ile Met Asn Leu Ile  
2780                    2785                    2790

Asn Asp Pro Ala Ala Asn Ser Glu Gln Gln Gln Ile Gln Pro Phe  
2795                    2800                    2805

Thr Trp Gln Gln Tyr Glu Ala Ile Ala Arg Leu Asp Pro Met Val

2810                    2815                    2820

Ala Phe Arg Ile Lys Glu Arg Ser Arg Lys His Lys Ala Thr Pro  
2825                    2830                    2835

Met Gln Phe Tyr Leu Ala Ala Tyr His Val Leu Leu Ala Arg Leu  
2840                    2845                    2850

Thr Gly Ser Lys Asp Ile Thr Ile Gly Leu Ala Glu Thr Asn Arg  
2855                    2860                    2865

Ser Thr Met Glu Glu Ile Ser Ala Met Gly Phe Phe Ala Asn Val  
2870                    2875                    2880

Leu Pro Leu Arg Phe Asp Glu Phe Val Gly Ser Lys Thr Phe Gly  
2885                    2890                    2895

Glu His Leu Val Ala Thr Lys Asp Ser Val Arg Glu Ala Met Gln  
2900                    2905                    2910

His Ala Arg Val Pro Tyr Gly Val Ile Leu Asp Cys Leu Gly Leu  
2915                    2920                    2925

Asn Leu Pro Thr Ser Gly Glu Glu Pro Lys Thr Gln Thr His Ala  
2930                    2935                    2940

Pro Leu Phe Gln Ala Val Phe Asp Tyr Lys Gln Gly Gln Ala Glu

2945                  2950                  2955

Ser Gly Ser Ile Gly Asn Ala Lys Met Thr Ser Val Leu Ala Ser  
2960                  2965                  2970

Arg Glu Arg Thr Pro Tyr Asp Ile Val Leu Glu Met Trp Asp Asp  
2975                  2980                  2985

Pro Thr Lys Asp Pro Leu Ile His Val Lys Leu Gln Ser Ser Leu  
2990                  2995                  3000

Tyr Gly Pro Glu His Ala Gln Ala Phe Val Asp His Phe Ser Ser  
3005                  3010                  3015

Ile Leu Thr Met Phe Ser Met Asn Pro Ala Leu Lys Leu Ala  
3020                  3025                  3030

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<211> 7692

<212> DNA

<213> *Penicillium citrinum*

<220>

<221> CDS

<222> (1)..(7692)

<400> 45

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1                  5                  10                  15

gca acc gca atg gca ggc tcg gct tgc tct aac aca tcc acg ccc att			96
Ala Thr Ala Met Ala Gly Ser Ala Cys Ser Asn Thr Ser Thr Pro Ile			
20	25	30	
gcc ata gtt gga atg gga tgt cga ttt gct gga gat gca acg agt cca			144
Ala Ile Val Gly Met Gly Cys Arg Phe Ala Gly Asp Ala Thr Ser Pro			
35	40	45	
cag aag ctt tgg gaa atg gtt gaa aga gga ggc agt gcc tgg tct aag			192
Gln Lys Leu Trp Glu Met Val Glu Arg Gly Gly Ser Ala Trp Ser Lys			
50	55	60	
gtc ccc tcc tcg cga ttc aat gtg aga gga gta tac cac ccg aat ggc			240
Val Pro Ser Ser Arg Phe Asn Val Arg Gly Val Tyr His Pro Asn Gly			
65	70	75	80
gaa agg gtc ggg tcc acc cac gta aag ggt gga cac ttc atc gac gag			288
Glu Arg Val Gly Ser Thr His Val Lys Gly Gly His Phe Ile Asp Glu			
85	90	95	
gat cct gct tta ttt gac gcc gcg ttc ttc aac atg acc aca gag gtc			336
Asp Pro Ala Leu Phe Asp Ala Ala Phe Phe Asn Met Thr Thr Glu Val			
100	105	110	
gcc agc tgc atg gat ccg cag tat cgg ctt atg ctt gag gtg gtc tac			384
Ala Ser Cys Met Asp Pro Gln Tyr Arg Leu Met Leu Glu Val Val Tyr			
115	120	125	
gaa tcg ctg gag agt gcc ggt atc acc atc gat ggt atg gca ggc tct			432
Glu Ser Leu Glu Ser Ala Gly Ile Thr Ile Asp Gly Met Ala Gly Ser			
130	135	140	
aat acg tcg gtg ttt ggg ggt gtc atg tac cac gac tat cag gat tcg			480
Asn Thr Ser Val Phe Gly Gly Val Met Tyr His Asp Tyr Gln Asp Ser			
145	150	155	160

ctc aat cgt gac ccc gag aca gtt ccg cgt tat ttc ata act ggc aac 528  
Leu Asn Arg Asp Pro Glu Thr Val Pro Arg Tyr Phe Ile Thr Gly Asn  
165 170 175

tca gga aca atg ctt tcg aac cgg ata tca cac ttc tac gac tta cgt 576  
Ser Gly Thr Met Leu Ser Asn Arg Ile Ser His Phe Tyr Asp Leu Arg  
180 185 190

ggt ccc agc gtg acg gtt gac acg gcc tgt tcg acg aca ttg acc gca 624  
Gly Pro Ser Val Thr Val Asp Thr Ala Cys Ser Thr Thr Leu Thr Ala  
195 200 205

ctg cac ttg gcg tgc cag agc tta cgt act ggg gag tca gat aca gcc 672  
Leu His Leu Ala Cys Gln Ser Leu Arg Thr Gly Glu Ser Asp Thr Ala  
210 215 220

atc gtt atc ggt gca aat ctt ctg ctc aat ccc gat gtt ttt gtt acg 720  
Ile Val Ile Gly Ala Asn Leu Leu Leu Asn Pro Asp Val Phe Val Thr  
225 230 235 240

atg tca aac ctg gga ttt ttg tcc ccg gat ggt atc tcg tac tct ttt 768  
Met Ser Asn Leu Gly Phe Leu Ser Pro Asp Gly Ile Ser Tyr Ser Phe  
245 250 255

gat cct cga gcg aat gga tat ggt cgc ggg gaa gga att gcc gct ctg 816  
Asp Pro Arg Ala Asn Gly Tyr Gly Arg Gly Glu Gly Ile Ala Ala Leu  
260 265 270

gta ata aag gcc ctc cct aac gcg ttg cga gac caa gac cct atc cga 864  
Val Ile Lys Ala Leu Pro Asn Ala Leu Arg Asp Gln Asp Pro Ile Arg  
275 280 285

gcc gtc att cga gag aca gcg ctg aac cag gat ggc aaa aca ccc gca 912  
Ala Val Ile Arg Glu Thr Ala Leu Asn Gln Asp Gly Lys Thr Pro Ala  
290 295 300

att act gcg ccg agt gat gtg gcg cag aaa agt ctg atc cag gag tgt			960
Ile Thr Ala Pro Ser Asp Val Ala Gln Lys Ser Leu Ile Gln Glu Cys			
305	310	315	320
tac gat aag gct ggg cta gat atg tcg ttg acc tcg tac gtg gag gcc			1008
Tyr Asp Lys Ala Gly Leu Asp Met Ser Leu Thr Ser Tyr Val Glu Ala			
325	330	335	
cac gga act gga aca cca act ggt gac ccc ctt gaa atc tca gca att			1056
His Gly Thr Gly Thr Pro Thr Gly Asp Pro Leu Glu Ile Ser Ala Ile			
340	345	350	
tca gca gct ttt aaa gga cat cct ctg cac ctt ggc tct gtg aaa gca			1104
Ser Ala Ala Phe Lys Gly His Pro Leu His Leu Gly Ser Val Lys Ala			
355	360	365	
aat att ggc cat aca gaa gcc gcc agt ggc ctg gcc agt ata atc aag			1152
Asn Ile Gly His Thr Glu Ala Ala Ser Gly Leu Ala Ser Ile Ile Lys			
370	375	380	
gtg gcc ttg gcc ttg gag aag ggc ttg att ccc cct aat gcg cgg ttc			1200
Val Ala Leu Ala Leu Glu Lys Gly Leu Ile Pro Pro Asn Ala Arg Phe			
385	390	395	400
ctg caa aag aac agc aag ctg atg ctt gac caa aag aac atc aag atc			1248
Leu Gln Lys Asn Ser Lys Leu Met Leu Asp Gln Lys Asn Ile Lys Ile			
405	410	415	
ccc atg tct gct caa gac tgg cct gtg aaa gat ggg act cgt cgc gca			1296
Pro Met Ser Ala Gln Asp Trp Pro Val Lys Asp Gly Thr Arg Arg Ala			
420	425	430	
tct gtc aat aac ttc ggc ttt ggt ggt tcg aat gct cac gtc att ttg			1344
Ser Val Asn Asn Phe Gly Phe Gly Gly Ser Asn Ala His Val Ile Leu			
435	440	445	

gaa tca tat gat cgc gca tca ttg gcc ctg cca gag gat caa gtg cat			1392
Glu Ser Tyr Asp Arg Ala Ser Leu Ala Leu Pro Glu Asp Gln Val His			
450	455	460	
gtc aat ggt aac tct gag cat ggt agg gtt gag gat ggt tcc aaa cag			1440
Val Asn Gly Asn Ser Glu His Gly Arg Val Glu Asp Gly Ser Lys Gln			
465	470	475	480
agc cgc ata tac gtt gtg cgt gcc aag gac gag caa gct tgt cgg cga			1488
Ser Arg Ile Tyr Val Val Arg Ala Lys Asp Glu Gln Ala Cys Arg Arg			
485	490	495	
acg ata gca agc ctg cga gac tac att aaa tcc gtc gct gac att gac			1536
Thr Ile Ala Ser Leu Arg Asp Tyr Ile Lys Ser Val Ala Asp Ile Asp			
500	505	510	
ggg gaa ccc ttc ctc gcc agc ctc gcc tat aca cta ggc tct cgc cgt			1584
Gly Glu Pro Phe Leu Ala Ser Leu Ala Tyr Thr Leu Gly Ser Arg Arg			
515	520	525	
tcc att ctg cca tgg acg tca gtg tat gta gca gac agc ctt ggc ggc			1632
Ser Ile Leu Pro Trp Thr Ser Val Tyr Val Ala Asp Ser Leu Gly Gly			
530	535	540	
ctt gtt tct gcc ctc agc gat gag tcc aat caa cca aaa cga gcg aat			1680
Leu Val Ser Ala Leu Ser Asp Glu Ser Asn Gln Pro Lys Arg Ala Asn			
545	550	555	560
gag aaa gta cgg ctc gga ttt gta ttc acc ggt cag ggg gcg cag tgg			1728
Glu Lys Val Arg Leu Gly Phe Val Phe Thr Gly Gln Gly Ala Gln Trp			
565	570	575	
cat gca atg ggc aga gag ctg gtc aat aca ttc cca gta ttc aaa cag			1776
His Ala Met Gly Arg Glu Leu Val Asn Thr Phe Pro Val Phe Lys Gln			
580	585	590	

gcg att ctt gaa tgt gat ggc tac atc aag caa ctg ggc gcg agt tgg			1824
Ala Ile Leu Glu Cys Asp Gly Tyr Ile Lys Gln Leu Gly Ala Ser Trp			
595	600	605	
aat ttt atg gag gag ctc cac cgt gat gag ctg acg act cg <sup>g</sup> gta aat			1872
Asn Phe Met Glu Glu Leu His Arg Asp Glu Leu Thr Thr Arg Val Asn			
610	615	620	
gat gcc gaa tac agt cta cca ctg tca acc gct atc caa att gca ctt			1920
Asp Ala Glu Tyr Ser Leu Pro Leu Ser Thr Ala Ile Gln Ile Ala Leu			
625	630	635	640
gtg cgt ctc ctt tgg tca tgg gga att cg <sup>g</sup> cca acg ggg ata acc agt			1968
Val Arg Leu Leu Trp Ser Trp Gly Ile Arg Pro Thr Gly Ile Thr Ser			
645	650	655	
cac tca agt gga gag gct gct gct gcc tac gca gct ggg gct tta tcc			2016
His Ser Ser Gly Glu Ala Ala Ala Ala Tyr Ala Ala Gly Ala Leu Ser			
660	665	670	
gcg cgg tcg gcc att ggg atc act tat ata cgc ggt gta ttg acc act			2064
Ala Arg Ser Ala Ile Gly Ile Thr Tyr Ile Arg Gly Val Leu Thr Thr			
675	680	685	
aag ccc aag ccc gca ttg gca gcc aaa gga gga atg atg gcg gtg ggt			2112
Lys Pro Lys Pro Ala Leu Ala Ala Lys Gly Gly Met Met Ala Val Gly			
690	695	700	
ctt ggt cgc agt gag acc aat gtt tac att tcg cgt ctc aac cag gag			2160
Leu Gly Arg Ser Glu Thr Asn Val Tyr Ile Ser Arg Leu Asn Gln Glu			
705	710	715	720
gac ggc tgt gtg gtg gtt gga tgt atc aac agt caa tgt agt gtg acg			2208
Asp Gly Cys Val Val Val Gly Cys Ile Asn Ser Gln Cys Ser Val Thr			
725	730	735	

gtg tcg gga gat ttg ggt gca atc gag aaa ctt gaa aag ttg tta cac			2256
Val Ser Gly Asp Leu Gly Ala Ile Glu Lys Leu Glu Lys Leu Leu His			
740	745	750	
gcc gat ggc atc ttt acc agg aaa ctg aaa gtc act gaa gcc ttc cat			2304
Ala Asp Gly Ile Phe Thr Arg Lys Leu Lys Val Thr Glu Ala Phe His			
755	760	765	
tca agc cac atg cga cca atg gca gat gcc ttt ggg gcg tca ctg aga			2352
Ser Ser His Met Arg Pro Met Ala Asp Ala Phe Gly Ala Ser Leu Arg			
770	775	780	
gat ctg ttc aac tcg gat aac aac aac gac aat ccc aat gct gac acc			2400
Asp Leu Phe Asn Ser Asp Asn Asn Asn Asp Asn Pro Asn Ala Asp Thr			
785	790	795	800
tca aag ggt gta tta tat tca tca cct aag act ggt agt cgc atg acc			2448
Ser Lys Gly Val Leu Tyr Ser Ser Pro Lys Thr Gly Ser Arg Met Thr			
805	810	815	
gat ctt aaa ttg cta ttg gat ccc aca cac tgg atg gat agt atg cta			2496
Asp Leu Lys Leu Leu Asp Pro Thr His Trp Met Asp Ser Met Leu			
820	825	830	
cag ccg gta gag ttc gag tcc tca ctc cgc gag atg tgc ttt gat ccc			2544
Gln Pro Val Glu Phe Glu Ser Ser Leu Arg Glu Met Cys Phe Asp Pro			
835	840	845	
aac acc aaa gag aaa gcc gtc gat gtg att att gaa ata ggg cct cac			2592
Asn Thr Lys Glu Lys Ala Val Asp Val Ile Ile Glu Ile Gly Pro His			
850	855	860	
gga gcg ctt ggt ggt cca atc aac caa gtc atg cag gat ctg ggt ctg			2640
Gly Ala Leu Gly Gly Pro Ile Asn Gln Val Met Gln Asp Leu Gly Leu			
865	870	875	880

aaa gga aca gat ata aac tat ctc agt tgc ctt tct cgc ggc aga agc			2688
Lys Gly Thr Asp Ile Asn Tyr Leu Ser Cys Leu Ser Arg Gly Arg Ser			
885	890	895	
tcg ttg gag aca atg tat cgt gct acg gag ttg ata agc aag ggt			2736
Ser Leu Glu Thr Met Tyr Arg Ala Ala Thr Glu Leu Ile Ser Lys Gly			
900	905	910	
tat ggg ctc aaa atg gac gct ata aac ttt cct cat gga aga aaa gag			2784
Tyr Gly Leu Lys Met Asp Ala Ile Asn Phe Pro His Gly Arg Lys Glu			
915	920	925	
ccc aga gtg aag gta ctg agc gat ttg ccg gcg tac ccg tgg aat cac			2832
Pro Arg Val Lys Val Leu Ser Asp Leu Pro Ala Tyr Pro Trp Asn His			
930	935	940	
caa acc cgt tat tgg aga gag cct cgc ggc agt cgt gag tcc aaa cag			2880
Gln Thr Arg Tyr Trp Arg Glu Pro Arg Gly Ser Arg Glu Ser Lys Gln			
945	950	955	960
aga acc cat ccg cct cac act ttg ata ggc tca cgg gaa tct ctc tct			2928
Arg Thr His Pro Pro His Thr Leu Ile Gly Ser Arg Glu Ser Leu Ser			
965	970	975	
cct cat ttc gcg cct aaa tgg aaa cat gtt ctc cgt ctg tca gat att			2976
Pro His Phe Ala Pro Lys Trp Lys His Val Leu Arg Leu Ser Asp Ile			
980	985	990	
cca tgg ata cga gat cac gtc gtt ggt tcg agc atc atc ttt ccg gga			3024
Pro Trp Ile Arg Asp His Val Val Gly Ser Ser Ile Ile Phe Pro Gly			
995	1000	1005	
gct ggc ttc atc agc atg gcc atc gag ggg ttt tca caa gtc tgc			3069
Ala Gly Phe Ile Ser Met Ala Ile Glu Gly Phe Ser Gln Val Cys			
1010	1015	1020	

cca cca	gtt gcg ggg gct agc	atc aac tac aac ttg	cgt gac gtt	3114
Pro Pro	Val Ala Gly Ala Ser	Ile Asn Tyr Asn Leu	Arg Asp Val	
1025	1030	1035		
gaa ctc	gct ctc ata	ata ccc gct gat gca	gaa gca gag	3159
Glu Leu	Ala Gln Ala Leu Ile	Ile Pro Ala Asp Ala	Glu Ala Glu	
1040	1045	1050		
gtt gac	ctg cgc cta acg atc	cgt tca tgt gag gaa	agg tcc ctc	3204
Val Asp	Leu Arg Leu Thr Ile	Arg Ser Cys Glu Glu	Arg Ser Leu	
1055	1060	1065		
ggc aca	aag aac tgg cat caa	ttt tct gtg cac tca	att tcg ggc	3249
Gly Thr	Lys Asn Trp His Gln	Phe Ser Val His Ser	Ile Ser Gly	
1070	1075	1080		
gaa aat	aat acc tgg aca gaa	cac tgc acc gga tta	ata cgt tcg	3294
Glu Asn	Asn Thr Trp Thr Glu	His Cys Thr Gly Leu	Ile Arg Ser	
1085	1090	1095		
gag agc	gaa aga agc cac ctt	gac tgt tca act gtg	gaa gcc tca	3339
Glu Ser	Glu Arg Ser His Leu	Asp Cys Ser Thr Val	Glu Ala Ser	
1100	1105	1110		
cgc agg	ttg aat cta ggc tca	gat aac cgg agc att	gat ccc aac	3384
Arg Arg	Leu Asn Leu Gly Ser	Asp Asn Arg Ser Ile	Asp Pro Asn	
1115	1120	1125		
gat ctc	tgg gag tcc tta cac	gcg aat ggg ata tgc	cac gga ccc	3429
Asp Leu	Trp Glu Ser Leu His	Ala Asn Gly Ile Cys	His Gly Pro	
1130	1135	1140		
att ttt	cag aac att cag cga	att caa aac aat gga	cag ggc tcg	3474
Ile Phe	Gln Asn Ile Gln Arg	Ile Gln Asn Asn Gly	Gln Gly Ser	
1145	1150	1155		

ttt tgc aga ttt tcc att gct	gac act gcc tcg gct	atg cct cac	3519
Phe Cys Arg Phe Ser Ile Ala	Asp Thr Ala Ser Ala	Met Pro His	
1160	1165	1170	
tcg tac gag aat cga cac atc	gtc cat cct act act	ctg gac tcg	3564
Ser Tyr Glu Asn Arg His Ile	Val His Pro Thr Thr	Leu Asp Ser	
1175	1180	1185	
gtg atc cag gcg gca tac acg	gtg tta ccc tac gcg	gga aca cgt	3609
Val Ile Gln Ala Ala Tyr Thr	Val Leu Pro Tyr Ala	Gly Thr Arg	
1190	1195	1200	
atg aaa acg gcc atg gta cca	agg agg cta aga aat	gtc aaa ata	3654
Met Lys Thr Ala Met Val Pro	Arg Arg Leu Arg Asn	Val Lys Ile	
1205	1210	1215	
tcc tct agc ctg gct gac ttg	gag gct ggt gat gct	ctg gac gca	3699
Ser Ser Ser Leu Ala Asp Leu	Glu Ala Gly Asp Ala	Leu Asp Ala	
1220	1225	1230	
cag gcc agc atc aag gat cgc	aac tct caa tcc ttc	tct acc gac	3744
Gln Ala Ser Ile Lys Asp Arg	Asn Ser Gln Ser Phe	Ser Thr Asp	
1235	1240	1245	
ttg gca gtg ttt gat gac tat	gat agc ggt tct tct	ccc tcg gac	3789
Leu Ala Val Phe Asp Asp Tyr	Asp Ser Gly Ser Ser	Pro Ser Asp	
1250	1255	1260	
gga atc cca gtc ata gag att	gaa ggc ctt gtt ttc	cag tcg gtt	3834
Gly Ile Pro Val Ile Glu Ile	Glu Gly Leu Val Phe	Gln Ser Val	
1265	1270	1275	
gga agc age ttc tct gac caa	aag tca gac tcc aac	gac aca gaa	3879
Gly Ser Ser Phe Ser Asp Gln	Lys Ser Asp Ser Asn	Asp Thr Glu	
1280	1285	1290	

aat gcc tgc agc tcc tgg gtt	tgg gcc cct gac atc	agc ttg ggt	3924
Asn Ala Cys Ser Ser Trp Val	Trp Ala Pro Asp Ile	Ser Leu Gly	
1295	1300	1305	
gac tcc act tgg ctc aaa gaa	aag ttg agc act gag	gct gag acg	3969
Asp Ser Thr Trp Leu Lys Glu	Lys Leu Ser Thr Glu	Ala Glu Thr	
1310	1315	1320	
aaa gaa acg gaa ctc atg atg	gac ctc.cga aga tgc	acg atc aac	4014
Lys Glu Thr Glu Leu Met Met	Asp Leu Arg Arg Cys	Thr Ile Asn	
1325	1330	1335	
ttt ata cag gag gct gtc act	gat ttg aca aat tct	gat atc caa	4059
Phe Ile Gln Glu Ala Val Thr	Asp Leu Thr Asn Ser	Asp Ile Gln	
1340	1345	1350	
cat ctg gat ggc cac ctt cag	aag tat ttc gat tgg	atg aat gtc	4104
His Leu Asp Gly His Leu Gln	Lys Tyr Phe Asp Trp	Met Asn Val	
1355	1360	1365	
caa ttg gac ctt gcg aga caa	aac aag ctc agc cca	gcc agt tgc	4149
Gln Leu Asp Leu Ala Arg Gln	Asn Lys Leu Ser Pro	Ala Ser Cys	
1370	1375	1380	
gac tgg cta agt gac gat gct	gag cag aag aaa tgc	cta cag gcc	4194
Asp Trp Leu Ser Asp Asp Ala	Glu Gln Lys Lys Cys	Leu Gln Ala	
1385	1390	1395	
aga gtc gct gga gaa agc gtc	aat ggc gag atg att	tct cgt cta	4239
Arg Val Ala Gly Glu Ser Val	Asn Gly Glu Met Ile	Ser Arg Leu	
1400	1405	1410	
gga cct cag tta ata gca atg	cta cgc cgc gaa aca	gag cca ctt	4284
Gly Pro Gln Leu Ile Ala Met	Leu Arg Arg Glu Thr	Glu Pro Leu	
1415	1420	1425	

gag ttg atg atg caa gat cag ctg cta agc aga tac tac gtc aac 4329  
Glu Leu Met Met Gln Asp Gln Leu Leu Ser Arg Tyr Tyr Val Asn  
1430 1435 1440

gca atc aaa tgg agc cga tca aac gca caa gcc agc gag ctg atc 4374  
Ala Ile Lys Trp Ser Arg Ser Asn Ala Gln Ala Ser Glu Leu Ile  
1445 1450 1455

cga ctt tgc gcc cac aag aac ccg cgt tct cgc att ttg gag att 4419  
Arg Leu Cys Ala His Lys Asn Pro Arg Ser Arg Ile Leu Glu Ile  
1460 1465 1470

ggc gga ggc acg ggc ggc tgc aca aag ctt att gtc aat gca ttg 4464  
Gly Gly Gly Thr Gly Gly Cys Thr Lys Leu Ile Val Asn Ala Leu  
1475 1480 1485

gga aac acc aag ccg atc gat cgt tat gac ttc acc gat gtg tct 4509  
Gly Asn Thr Lys Pro Ile Asp Arg Tyr Asp Phe Thr Asp Val Ser  
1490 1495 1500

gcc ggg ttt ttc gag tcg gcg cgt gag caa ttt gcg gat tgg caa 4554  
Ala Gly Phe Phe Glu Ser Ala Arg Glu Gln Phe Ala Asp Trp Gln  
1505 1510 1515

gac gtg atg act ttc aaa aaa ttg gat att gaa agc gat ccc gag 4599  
Asp Val Met Thr Phe Lys Lys Leu Asp Ile Glu Ser Asp Pro Glu  
1520 1525 1530

caa caa ggg ttt gaa tgt gcc acc tac gat gtg gtc gtg gct tgc 4644  
Gln Gln Gly Phe Glu Cys Ala Thr Tyr Asp Val Val Val Ala Cys  
1535 1540 1545

cag gtc ctg cat gca act cga tgc atg aaa cga aca ctg agt aac 4689  
Gln Val Leu His Ala Thr Arg Cys Met Lys Arg Thr Leu Ser Asn  
1550 1555 1560

gtt cga	aaa ttg ctc aag cct	ggg ggc aac ttg att	t <sub>tg</sub> gtt gag	4734
Val Arg	Lys Leu Leu Lys Pro	Gly Gly Asn Leu Ile	Leu Val Glu	
1565	1570	1575		
act acc	agg gat cag ctc gat	t <sub>tg</sub> t <sub>tc</sub> t <sub>tt</sub> acc t <sub>tc</sub>	gga ctg t <sub>tg</sub>	4779
Thr Thr	Arg Asp Gln Leu Asp	Leu Phe Phe Thr Phe	Gly Leu Leu	
1580	1585	1590		
cca ggt	t <sub>gg</sub> t <sub>gg</sub> ctc agt gag	gag cct gag cgg aag	t <sub>cg</sub> acg cca	4824
Pro Gly	Trp Trp Leu Ser Glu	Glu Pro Glu Arg Lys	Ser Thr Pro	
1595	1600	1605		
t <sub>cg</sub> ctc	act acc gat ctt t <sub>gg</sub>	aac acc atg t <sub>tg</sub> gac	acg acg ggt	4869
Ser Leu	Thr Thr Asp Leu Trp	Asn Thr Met Leu Asp	Thr Ser Gly	
1610	1615	1620		
t <sub>tc</sub> aac	ggt gtg gaa t <sub>tg</sub> gag	g <sub>tt</sub> cgt gat t <sub>gt</sub> gaa	gac gat gag	4914
Phe Asn	Gly Val Glu Leu Glu	Val Arg Asp Cys Glu	Asp Asp Glu	
1625	1630	1635		
t <sub>tt</sub> tac	atg atc agc aca atg	cta t <sub>cg</sub> acg gct aga	aaa gag aat	4959
Phe Tyr	Met Ile Ser Thr Met	Leu Ser Thr Ala Arg	Lys Glu Asn	
1640	1645	1650		
aca acc	ccg gat aca gtg gca	gaa t <sub>cg</sub> gag gtg ctt	t <sub>tg</sub> ctg cac	5004
Thr Thr	Pro Asp Thr Val Ala	Glu Ser Glu Val Leu	Leu Leu His	
1655	1660	1665		
gga gcg	ctc cga cct cct tca	t <sub>ct</sub> t <sub>gg</sub> ctg gaa agt	ctc cag gca	5049
Gly Ala	Leu Arg Pro Pro Ser	Ser Trp Leu Glu Ser	Leu Gln Ala	
1670	1675	1680		
gca att	t <sub>gt</sub> gaa aag acc agt	t <sub>ct</sub> agc cca t <sub>cg</sub> atc	aac gct ctg	5094
Ala Ile	Cys Glu Lys Thr Ser	Ser Ser Pro Ser Ile	Asn Ala Leu	
1685	1690	1695		

ggc gag gta gat acc act gga	agg aca tgc att ttt	ctt ggg gaa	5139
Gly Glu Val Asp Thr Thr Gly	Arg Thr Cys Ile Phe	Leu Gly Glu	
1700	1705	1710	
atg gag tcc tcg ctc ctt gga	gag gtg gga agc gag	acc ttc aaa	5184
Met Glu Ser Ser Leu Leu Gly	Glu Val Gly Ser Glu	Thr Phe Lys	
1715	1720	1725	
tcc atc acc gcg atg ctg aat	aac tgc aac gca ctt	ctc tgg gtg	5229
Ser Ile Thr Ala Met Leu Asn	Asn Cys Asn Ala Leu	Leu Trp Val	
1730	1735	1740	
tct aga gga gca gcc atg agc	tcc gag gat cca tgg	aaa gct cta	5274
Ser Arg Gly Ala Ala Met Ser	Ser Glu Asp Pro Trp	Lys Ala Leu	
1745	1750	1755	
cat att ggt ctg ctg cgt acc	atc cgc aac gaa aat	aac ggg aag	5319
His Ile Gly Leu Leu Arg Thr	Ile Arg Asn Glu Asn	Asn Gly Lys	
1760	1765	1770	
gaa tat gta tcg ttg gat ctc	gat cct tct cga aac	gca tac acc	5364
Glu Tyr Val Ser Leu Asp Leu	Asp Pro Ser Arg Asn	Ala Tyr Thr	
1775	1780	1785	
cac gag tcc ctg tat gct atc	tgc aat atc ttc aat	ggc cgc ctc	5409
His Glu Ser Leu Tyr Ala Ile	Cys Asn Ile Phe Asn	Gly Arg Leu	
1790	1795	1800	
ggc gac ctt tcc gaa gac aag	gag ttt gaa ttt gca	gag aga aac	5454
Gly Asp Leu Ser Glu Asp Lys	Glu Phe Glu Phe Ala	Glu Arg Asn	
1805	1810	1815	
ggc gtc atc cac gta ccg cga	ctt ttc aat gac ccg	cac tgg aag	5499
Gly Val Ile His Val Pro Arg	Leu Phe Asn Asp Pro	His Trp Lys	
1820	1825	1830	

gac caa gaa gcg gtt gag gtc aca ctg cag ccg ttc gag caa ccc			5544
Asp Gln Glu Ala Val Glu Val Thr Leu Gln Pro Phe Glu Gln Pro			
1835	1840	1845	
ggg cgt cgt ctg cgg atg gag gtt gag acg cca ggg ctc tta gac			5589
Gly Arg Arg Leu Arg Met Glu Val Glu Thr Pro Gly Leu Leu Asp			
1850	1855	1860	
tcc ctg caa ttt cga gac gac gaa gga cgt gaa ggc aag gat ctt			5634
Ser Leu Gln Phe Arg Asp Asp Glu Gly Arg Glu Gly Lys Asp Leu			
1865	1870	1875	
ccg gat gat tgg gta gaa atc gaa ccc aaa gct ttc ggt ctc aat			5679
Pro Asp Asp Trp Val Glu Ile Glu Pro Lys Ala Phe Gly Leu Asn			
1880	1885	1890	
ttt cgg gat gtc atg gtt gcc atg ggt caa ttg gag gcc aac cgt			5724
Phe Arg Asp Val Met Val Ala Met Gly Gln Leu Glu Ala Asn Arg			
1895	1900	1905	
gtg atg ggc ttc gaa tgc gcc gga gtg atc aca aag ctc ggt gga			5769
Val Met Gly Phe Glu Cys Ala Gly Val Ile Thr Lys Leu Gly Gly			
1910	1915	1920	
gct gct gcc gct agc caa ggc ctc aga tta ggg gac cgc gta tgt			5814
Ala Ala Ala Ala Ser Gln Gly Leu Arg Leu Gly Asp Arg Val Cys			
1925	1930	1935	
gca cta ctg aaa ggc cat tgg gcg acc aga aca cag acg ccg tac			5859
Ala Leu Leu Lys Gly His Trp Ala Thr Arg Thr Gln Thr Pro Tyr			
1940	1945	1950	
act aat gtc gtc cgt att ccg gac gaa atg ggc ttc cca gaa gcc			5904
Thr Asn Val Val Arg Ile Pro Asp Glu Met Gly Phe Pro Glu Ala			
1955	1960	1965	

gct tcg	gtc ccc ctg gct ttc	act acc gca tat att	gcg ctt tat	5949
Ala Ser	Val Pro Leu Ala Phe	Thr Thr Ala Tyr Ile	Ala Leu Tyr	
1970	1975	1980		
acc acg	gca aag cta cga cga	ggc gaa aga gtc ttg	atc cac agt	5994
Thr Thr	Ala Lys Leu Arg Arg	Gly Glu Arg Val Leu	Ile His Ser	
1985	1990	1995		
gga gct	gga ggc gtc ggt caa	gca gcg atc att ttg	tcc cag ctt	6039
Gly Ala	Gly Gly Val Gly Gln	Ala Ala Ile Ile Leu	Ser Gln Leu	
2000	2005	2010		
gcg ggt	gcc gag gtc ttc gtc	aca gcg gga act caa	gcc aag cgt	6084
Ala Gly	Ala Glu Val Phe Val	Thr Ala Gly Thr Gln	Ala Lys Arg	
2015	2020	2025		
gac ttt	gtc ggc gat aaa ttc	ggc atc aat ccg gat	cat atc ttc	6129
Asp Phe	Val Gly Asp Lys Phe	Gly Ile Asn Pro Asp	His Ile Phe	
2030	2035	2040		
tcg agc	agg aat gac tta ttc	gtc gac ggc atc aaa	gcc tac acg	6174
Ser Ser	Arg Asn Asp Leu Phe	Val Asp Gly Ile Lys	Ala Tyr Thr	
2045	2050	2055		
ggc gga	ctt ggc gtt cat gtc	gtt cta aac tca ttg	gca ggt caa	6219
Gly Gly	Leu Gly Val His Val	Val Leu Asn Ser Leu	Ala Gly Gln	
2060	2065	2070		
ctc ctc	caa gca agc ttt gac	tgc atg gcc gaa ttc	ggc aga ttt	6264
Leu Leu	Gln Ala Ser Phe Asp	Cys Met Ala Glu Phe	Gly Arg Phe	
2075	2080	2085		
gtt gag	att gga aaa aag gac	ctg gag caa aac agc	aga ctt gac	6309
Val Glu	Ile Gly Lys Lys Asp	Leu Glu Gln Asn Ser	Arg Leu Asp	
2090	2095	2100		

atg ctg cca ttc acc cgg gac gtc tct ttc aca tca att gat ctt 6354  
Met Leu Pro Phe Thr Arg Asp Val Ser Phe Thr Ser Ile Asp Leu  
2105 2110 2115

ctc tcg tgg caa aga gcc aaa agt gaa gaa gta tcc gaa gcg ttg 6399  
Leu Ser Trp Gln Arg Ala Lys Ser Glu Glu Val Ser Glu Ala Leu  
2120 2125 2130

aac cat gtc aca aaa ctc ctc gag aca aaa gcg att ggc ttg att 6444  
Asn His Val Thr Lys Leu Leu Glu Thr Lys Ala Ile Gly Leu Ile  
2135 2140 2145

ggt cca atc cag cag cac tcc ttg tca aac atc gag aag gcc ttc 6489  
Gly Pro Ile Gln Gln His Ser Leu Ser Asn Ile Glu Lys Ala Phe  
2150 2155 2160

cgt acg atg cag agt ggt cag cat gtt ggc aaa gtt gtg gtc aat 6534  
Arg Thr Met Gln Ser Gly Gln His Val Gly Lys Val Val Val Asn  
2165 2170 2175

gta tct ggg gac gaa ctg gtc cca gtc ggc gat gga ggg ttc tcg 6579  
Val Ser Gly Asp Glu Leu Val Pro Val Gly Asp Gly Gly Phe Ser  
2180 2185 2190

ctg aag ctg aag cct gac agt tct tac cta gtt gct ggt ggg ctg 6624  
Leu Lys Leu Lys Pro Asp Ser Ser Tyr Leu Val Ala Gly Gly Leu  
2195 2200 2205

ggg gga att gga aag cag atc tgt cag tgg ctt gtt gat cat ggc 6669  
Gly Gly Ile Gly Lys Gln Ile Cys Gln Trp Leu Val Asp His Gly  
2210 2215 2220

gcg aag cac ttg att atc cta tcg aga agt gca aag gcc agt cca 6714  
Ala Lys His Leu Ile Ile Leu Ser Arg Ser Ala Lys Ala Ser Pro  
2225 2230 2235

ttc ata acc agc ttg caa aat caa cag tgc gct gtc tat cta cac		6759
Phe Ile Thr Ser Leu Gln Asn Gln Gln Cys Ala Val Tyr Leu His		
2240	2245	2250
gca tgt gac atc tca gat caa gat cag gtc acc aag gtg ctc cgg		6804
Ala Cys Asp Ile Ser Asp Gln Asp Gln Val Thr Lys Val Leu Arg		
2255	2260	2265
ttg tgc gaa gaa gca cat gca ccg cca att cga ggt atc ata caa		6849
Leu Cys Glu Glu Ala His Ala Pro Pro Ile Arg Gly Ile Ile Gln		
2270	2275	2280
ggt gcc atg gtt ctc aag gac gcg ctt cta tcg cga atg aca ttg		6894
Gly Ala Met Val Leu Lys Asp Ala Leu Leu Ser Arg Met Thr Leu		
2285	2290	2295
gat gaa ttt aat gca gca aca cgc cca aaa gta cag ggt agt tgg		6939
Asp Glu Phe Asn Ala Ala Thr Arg Pro Lys Val Gln Gly Ser Trp		
2300	2305	2310
tat ctt cac aag atc gca cag gat gtt gac ttc ttc gtg atg ctc		6984
Tyr Leu His Lys Ile Ala Gln Asp Val Asp Phe Phe Val Met Leu		
2315	2320	2325
tca tcc ctt gtt ggg gtc atg ggt ggg gca ggc cag gcc aat tac		7029
Ser Ser Leu Val Gly Val Met Gly Gly Ala Gly Gln Ala Asn Tyr		
2330	2335	2340
gca gct gct ggt gca ttc cag gac gca ctt gcg cac cac cgg aga		7074
Ala Ala Ala Gly Ala Phe Gln Asp Ala Leu Ala His His Arg Arg		
2345	2350	2355
gcc cat ggc atg ccg gct gtc acc att gac ttg ggc atg gtc aag		7119
Ala His Gly Met Pro Ala Val Thr Ile Asp Leu Gly Met Val Lys		
2360	2365	2370

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Ser Val Gly Tyr Val Ala Glu Thr Gly Arg Gly Val Ala Asp Arg

2375 2380 2385

ctc gct aga ata ggt tac aag cct atg cat gaa aag gac gtc atg 7209  
Leu Ala Arg Ile Gly Tyr Lys Pro Met His Glu Lys Asp Val Met  
2390 2395 2400

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Asp Val Leu Glu Lys Ala Ile Leu Cys Ser Ser Pro Gln Phe Pro  
2405 2410 2415

tca cct ccc gca gct gtg gtt aca gga atc aac aca tcc ccg ggt 7299  
Ser Pro Pro Ala Ala Val Val Thr Gly Ile Asn Thr Ser Pro Gly  
2420 2425 2430

gct cac tgg acc gag gca aac tgg ata cag gaa cag cgg ttt gtg 7344  
Ala His Trp Thr Glu Ala Asn Trp Ile Gln Glu Gln Arg Phe Val  
2435 2440 2445

gga ctt aaa tac cgc caa gtc ctt cat gca gac caa tcc ttt gtc 7389  
Gly Leu Lys Tyr Arg Gln Val Leu His Ala Asp Gln Ser Phe Val  
2450 2455 2460

tct tcg cat aaa aaa gga cca gat ggc gtg cgg gcc caa cta agc 7434  
Ser Ser His Lys Lys Gly Pro Asp Gly Val Arg Ala Gln Leu Ser  
2465 2470 2475

agg gtc acc tct cac gac gag gcc att tct atc gtc ctc aaa gca 7479  
Arg Val Thr Ser His Asp Glu Ala Ile Ser Ile Val Leu Lys Ala  
2480 2485 2490

atg acg gaa aag ctg atg cga atg ttt ggt ctg gca gaa gac gac 7524  
Met Thr Glu Lys Leu Met Arg Met Phe Gly Leu Ala Glu Asp Asp  
2495 2500 2505

atg tcc tcg tcc aaa aac ctg gca ggt gtc ggc gta gac tca ctc 7569  
Met Ser Ser Ser Lys Asn Leu Ala Gly Val Gly Val Asp Ser Leu  
2510 2515 2520

~  
gtc gcc att gaa ctt cga aac tgg atc aca tct gaa atc cat gtt 7614  
Val Ala Ile Glu Leu Arg Asn Trp Ile Thr Ser Glu Ile His Val  
2525 2530 2535

gat gtg tcg atc ttt gag ctc atg aat ggt aac acc atc gcc ggc 7659  
Asp Val Ser Ile Phe Glu Leu Met Asn Gly Asn Thr Ile Ala Gly  
2540 2545 2550

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<212> PRT

<213> *Penicillium citrinum*

<400> 46

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20 25 30

Ala Ile Val Gly Met Gly Cys Arg Phe Ala Gly Asp Ala Thr Ser Pro  
35 40 45

Gln Lys Leu Trp Glu Met Val Glu Arg Gly Gly Ser Ala Trp Ser Lys  
50                    55                    60

Val Pro Ser Ser Arg Phe Asn Val Arg Gly Val Tyr His Pro Asn Gly  
65                    70                    75                    80

Glu Arg Val Gly Ser Thr His Val Lys Gly Gly His Phe Ile Asp Glu  
85                    90                    95

Asp Pro Ala Leu Phe Asp Ala Ala Phe Phe Asn Met Thr Thr Glu Val  
100                    105                    110

Ala Ser Cys Met Asp Pro Gln Tyr Arg Leu Met Leu Glu Val Val Tyr  
115                    120                    125

Glu Ser Leu Glu Ser Ala Gly Ile Thr Ile Asp Gly Met Ala Gly Ser  
130                    135                    140

Asn Thr Ser Val Phe Gly Gly Val Met Tyr His Asp Tyr Gln Asp Ser  
145                    150                    155                    160

Leu Asn Arg Asp Pro Glu Thr Val Pro Arg Tyr Phe Ile Thr Gly Asn  
165                    170                    175

Ser Gly Thr Met Leu Ser Asn Arg Ile Ser His Phe Tyr Asp Leu Arg  
180                    185                    190

Gly Pro Ser Val Thr Val Asp Thr Ala Cys Ser Thr Thr Leu Thr Ala  
195 200 205

Leu His Leu Ala Cys Gln Ser Leu Arg Thr Gly Glu Ser Asp Thr Ala  
210 215 220

Ile Val Ile Gly Ala Asn Leu Leu Leu Asn Pro Asp Val Phe Val Thr  
225 230 235 240

Met Ser Asn Leu Gly Phe Leu Ser Pro Asp Gly Ile Ser Tyr Ser Phe  
245 250 255

Asp Pro Arg Ala Asn Gly Tyr Gly Arg Gly Glu Gly Ile Ala Ala Leu  
260 265 270

Val Ile Lys Ala Leu Pro Asn Ala Leu Arg Asp Gln Asp Pro Ile Arg  
275 280 285

Ala Val Ile Arg Glu Thr Ala Leu Asn Gln Asp Gly Lys Thr Pro Ala  
290 295 300

Ile Thr Ala Pro Ser Asp Val Ala Gln Lys Ser Leu Ile Gln Glu Cys  
305 310 315 320

Tyr Asp Lys Ala Gly Leu Asp Met Ser Leu Thr Ser Tyr Val Glu Ala  
325 330 335

His Gly Thr Gly Thr Pro Thr Gly Asp Pro Leu Glu Ile Ser Ala Ile  
340 345 350

Ser Ala Ala Phe Lys Gly His Pro Leu His Leu Gly Ser Val Lys Ala  
355 360 365

Asn Ile Gly His Thr Glu Ala Ala Ser Gly Leu Ala Ser Ile Ile Lys  
370 375 380

Val Ala Leu Ala Leu Glu Lys Gly Leu Ile Pro Pro Asn Ala Arg Phe  
385 390 395 400

Leu Gln Lys Asn Ser Lys Leu Met Leu Asp Gln Lys Asn Ile Lys Ile  
405 410 415

Pro Met Ser Ala Gln Asp Trp Pro Val Lys Asp Gly Thr Arg Arg Ala  
420 425 430

Ser Val Asn Asn Phe Gly Phe Gly Ser Asn Ala His Val Ile Leu  
435 440 445

Glu Ser Tyr Asp Arg Ala Ser Leu Ala Leu Pro Glu Asp Gln Val His  
450 455 460

Val Asn Gly Asn Ser Glu His Gly Arg Val Glu Asp Gly Ser Lys Gln  
465 470 475 480

Ser Arg Ile Tyr Val Val Arg Ala Lys Asp Glu Gln Ala Cys Arg Arg  
485                    490                    495

Thr Ile Ala Ser Leu Arg Asp Tyr Ile Lys Ser Val Ala Asp Ile Asp  
500                    505                    510

Gly Glu Pro Phe Leu Ala Ser Leu Ala Tyr Thr Leu Gly Ser Arg Arg  
515                    520                    525

Ser Ile Leu Pro Trp Thr Ser Val Tyr Val Ala Asp Ser Leu Gly Gly  
530                    535                    540

Leu Val Ser Ala Leu Ser Asp Glu Ser Asn Gln Pro Lys Arg Ala Asn  
545                    550                    555                    560

Glu Lys Val Arg Leu Gly Phe Val Phe Thr Gly Gln Gly Ala Gln Trp  
565                    570                    575

His Ala Met Gly Arg Glu Leu Val Asn Thr Phe Pro Val Phe Lys Gln  
580                    585                    590

Ala Ile Leu Glu Cys Asp Gly Tyr Ile Lys Gln Leu Gly Ala Ser Trp  
595                    600                    605

Asn Phe Met Glu Glu Leu His Arg Asp Glu Leu Thr Thr Arg Val Asn  
610                    615                    620

Asp Ala Glu Tyr Ser Leu Pro Leu Ser Thr Ala Ile Gln Ile Ala Leu  
625                    630                    635                    640

Val Arg Leu Leu Trp Ser Trp Gly Ile Arg Pro Thr Gly Ile Thr Ser  
645                    650                    655

His Ser Ser Gly Glu Ala Ala Ala Ala Tyr Ala Ala Gly Ala Leu Ser  
660                    665                    670

Ala Arg Ser Ala Ile Gly Ile Thr Tyr Ile Arg Gly Val Leu Thr Thr  
675                    680                    685

Lys Pro Lys Pro Ala Leu Ala Ala Lys Gly Gly Met Met Ala Val Gly  
690                    695                    700

Leu Gly Arg Ser Glu Thr Asn Val Tyr Ile Ser Arg Leu Asn Gln Glu  
705                    710                    715                    720

Asp Gly Cys Val Val Val Gly Cys Ile Asn Ser Gln Cys Ser Val Thr  
725                    730                    735

Val Ser Gly Asp Leu Gly Ala Ile Glu Lys Leu Glu Lys Leu Leu His  
740                    745                    750

Ala Asp Gly Ile Phe Thr Arg Lys Leu Lys Val Thr Glu Ala Phe His  
755                    760                    765

Ser Ser His Met Arg Pro Met Ala Asp Ala Phe Gly Ala Ser Leu Arg  
770                    775                    780

Asp Leu Phe Asn Ser Asp Asn Asn Asn Asp Asn Pro Asn Ala Asp Thr  
785                    790                    795                    800

Ser Lys Gly Val Leu Tyr Ser Ser Pro Lys Thr Gly Ser Arg Met Thr  
805                    810                    815

Asp Leu Lys Leu Leu Leu Asp Pro Thr His Trp Met Asp Ser Met Leu  
820                    825                    830

Gln Pro Val Glu Phe Glu Ser Ser Leu Arg Glu Met Cys Phe Asp Pro  
835                    840                    845

Asn Thr Lys Glu Lys Ala Val Asp Val Ile Ile Glu Ile Gly Pro His  
850                    855                    860

Gly Ala Leu Gly Gly Pro Ile Asn Gln Val Met Gln Asp Leu Gly Leu  
865                    870                    875                    880

Lys Gly Thr Asp Ile Asn Tyr Leu Ser Cys Leu Ser Arg Gly Arg Ser  
885                    890                    895

Ser Leu Glu Thr Met Tyr Arg Ala Ala Thr Glu Leu Ile Ser Lys Gly  
900                    905                    910

Tyr Gly Leu Lys Met Asp Ala Ile Asn Phe Pro His Gly Arg Lys Glu  
915                    920                    925

Pro Arg Val Lys Val Leu Ser Asp Leu Pro Ala Tyr Pro Trp Asn His  
930                    935                    940

Gln Thr Arg Tyr Trp Arg Glu Pro Arg Gly Ser Arg Glu Ser Lys Gln  
945                    950                    955                    960

Arg Thr His Pro Pro His Thr Leu Ile Gly Ser Arg Glu Ser Leu Ser  
965                    970                    975

Pro His Phe Ala Pro Lys Trp Lys His Val Leu Arg Leu Ser Asp Ile  
980                    985                    990

Pro Trp Ile Arg Asp His Val Val Gly Ser Ser Ile Ile Phe Pro Gly  
995                    1000                    1005

Ala Gly Phe Ile Ser Met Ala Ile Glu Gly Phe Ser Gln Val Cys  
1010                    1015                    1020

Pro Pro Val Ala Gly Ala Ser Ile Asn Tyr Asn Leu Arg Asp Val  
1025                    1030                    1035

Glu Leu Ala Gln Ala Leu Ile Ile Pro Ala Asp Ala Glu Ala Glu  
1040                    1045                    1050

Val Asp Leu Arg Leu Thr Ile Arg Ser Cys Glu Glu Arg Ser Leu  
1055 1060 1065

Gly Thr Lys Asn Trp His Gln Phe Ser Val His Ser Ile Ser Gly  
1070 1075 1080

Glu Asn Asn Thr Trp Thr Glu His Cys Thr Gly Leu Ile Arg Ser  
1085 1090 1095

Glu Ser Glu Arg Ser His Leu Asp Cys Ser Thr Val Glu Ala Ser  
1100 1105 1110

Arg Arg Leu Asn Leu Gly Ser Asp Asn Arg Ser Ile Asp Pro Asn  
1115 1120 1125

Asp Leu Trp Glu Ser Leu His Ala Asn Gly Ile Cys His Gly Pro  
1130 1135 1140

Ile Phe Gln Asn Ile Gln Arg Ile Gln Asn Asn Gly Gln Gly Ser  
1145 1150 1155

Phe Cys Arg Phe Ser Ile Ala Asp Thr Ala Ser Ala Met Pro His  
1160 1165 1170

Ser Tyr Glu Asn Arg His Ile Val His Pro Thr Thr Leu Asp Ser  
1175 1180 1185

Val Ile Gln Ala Ala Tyr Thr Val Leu Pro Tyr Ala Gly Thr Arg  
1190 1195 1200

Met Lys Thr Ala Met Val Pro Arg Arg Leu Arg Asn Val Lys Ile  
1205 1210 1215

Ser Ser Ser Leu Ala Asp Leu Glu Ala Gly Asp Ala Leu Asp Ala  
1220 1225 1230

Gln Ala Ser Ile Lys Asp Arg Asn Ser Gln Ser Phe Ser Thr Asp  
1235 1240 1245

Leu Ala Val Phe Asp Asp Tyr Asp Ser Gly Ser Ser Pro Ser Asp  
1250 1255 1260

Gly Ile Pro Val Ile Glu Ile Glu Gly Leu Val Phe Gln Ser Val  
1265 1270 1275

Gly Ser Ser Phe Ser Asp Gln Lys Ser Asp Ser Asn Asp Thr Glu  
1280 1285 1290

Asn Ala Cys Ser Ser Trp Val Trp Ala Pro Asp Ile Ser Leu Gly  
1295 1300 1305

Asp Ser Thr Trp Leu Lys Glu Lys Leu Ser Thr Glu Ala Glu Thr  
1310 1315 1320

Lys Glu Thr Glu Leu Met Met Asp Leu Arg Arg Cys Thr Ile Asn  
1325 1330 1335

Phe Ile Gln Glu Ala Val Thr Asp Leu Thr Asn Ser Asp Ile Gln  
1340 1345 1350

His Leu Asp Gly His Leu Gln Lys Tyr Phe Asp Trp Met Asn Val  
1355 1360 1365

Gln Leu Asp Leu Ala Arg Gln Asn Lys Leu Ser Pro Ala Ser Cys  
1370 1375 1380

Asp Trp Leu Ser Asp Asp Ala Glu Gln Lys Lys Cys Leu Gln Ala  
1385 1390 1395

Arg Val Ala Gly Glu Ser Val Asn Gly Glu Met Ile Ser Arg Leu  
1400 1405 1410

Gly Pro Gln Leu Ile Ala Met Leu Arg Arg Glu Thr Glu Pro Leu  
1415 1420 1425

Glu Leu Met Met Gln Asp Gln Leu Leu Ser Arg Tyr Tyr Val Asn  
1430 1435 1440

Ala Ile Lys Trp Ser Arg Ser Asn Ala Gln Ala Ser Glu Leu Ile  
1445 1450 1455

Arg Leu Cys Ala His Lys Asn Pro Arg Ser Arg Ile Leu Glu Ile  
1460 1465 1470

Gly Gly Gly Thr Gly Gly Cys Thr Lys Leu Ile Val Asn Ala Leu  
1475 1480 1485

Gly Asn Thr Lys Pro Ile Asp Arg Tyr Asp Phe Thr Asp Val Ser  
1490 1495 1500

Ala Gly Phe Phe Glu Ser Ala Arg Glu Gln Phe Ala Asp Trp Gln  
1505 1510 1515

Asp Val Met Thr Phe Lys Lys Leu Asp Ile Glu Ser Asp Pro Glu  
1520 1525 1530

Gln Gln Gly Phe Glu Cys Ala Thr Tyr Asp Val Val Val Ala Cys  
1535 1540 1545

Gln Val Leu His Ala Thr Arg Cys Met Lys Arg Thr Leu Ser Asn  
1550 1555 1560

Val Arg Lys Leu Leu Lys Pro Gly Gly Asn Leu Ile Leu Val Glu  
1565 1570 1575

Thr Thr Arg Asp Gln Leu Asp Leu Phe Phe Thr Phe Gly Leu Leu  
1580 1585 1590

Pro Gly Trp Trp Leu Ser Glu Glu Pro Glu Arg Lys Ser Thr Pro  
1595 1600 1605

Ser Leu Thr Thr Asp Leu Trp Asn Thr Met Leu Asp Thr Ser Gly  
1610 1615 1620

Phe Asn Gly Val Glu Leu Glu Val Arg Asp Cys Glu Asp Asp Glu  
1625 1630 1635

Phe Tyr Met Ile Ser Thr Met Leu Ser Thr Ala Arg Lys Glu Asn  
1640 1645 1650

Thr Thr Pro Asp Thr Val Ala Glu Ser Glu Val Leu Leu Leu His  
1655 1660 1665

Gly Ala Leu Arg Pro Pro Ser Ser Trp Leu Glu Ser Leu Gln Ala  
1670 1675 1680

Ala Ile Cys Glu Lys Thr Ser Ser Ser Pro Ser Ile Asn Ala Leu  
1685 1690 1695

Gly Glu Val Asp Thr Thr Gly Arg Thr Cys Ile Phe Leu Gly Glu  
1700 1705 1710

Met Glu Ser Ser Leu Leu Gly Glu Val Gly Ser Glu Thr Phe Lys  
1715 1720 1725

Ser Ile Thr Ala Met Leu Asn Asn Cys Asn Ala Leu Leu Trp Val  
1730 1735 1740

Ser Arg Gly Ala Ala Met Ser Ser Glu Asp Pro Trp Lys Ala Leu  
1745 1750 1755

His Ile Gly Leu Leu Arg Thr Ile Arg Asn Glu Asn Asn Gly Lys  
1760 1765 1770

Glu Tyr Val Ser Leu Asp Leu Asp Pro Ser Arg Asn Ala Tyr Thr  
1775 1780 1785

His Glu Ser Leu Tyr Ala Ile Cys Asn Ile Phe Asn Gly Arg Leu  
1790 1795 1800

Gly Asp Leu Ser Glu Asp Lys Glu Phe Glu Phe Ala Glu Arg Asn  
1805 1810 1815

Gly Val Ile His Val Pro Arg Leu Phe Asn Asp Pro His Trp Lys  
1820 1825 1830

Asp Gln Glu Ala Val Glu Val Thr Leu Gln Pro Phe Glu Gln Pro  
1835 1840 1845

Gly Arg Arg Leu Arg Met Glu Val Glu Thr Pro Gly Leu Leu Asp  
1850 1855 1860

Ser Leu Gln Phe Arg Asp Asp Glu Gly Arg Glu Gly Lys Asp Leu  
1865 1870 1875

Pro Asp Asp Trp Val Glu Ile Glu Pro Lys Ala Phe Gly Leu Asn  
1880 1885 1890

Phe Arg Asp Val Met Val Ala Met Gly Gln Leu Glu Ala Asn Arg  
1895 1900 1905

Val Met Gly Phe Glu Cys Ala Gly Val Ile Thr Lys Leu Gly Gly  
1910 1915 1920

Ala Ala Ala Ala Ser Gln Gly Leu Arg Leu Gly Asp Arg Val Cys  
1925 1930 1935

Ala Leu Leu Lys Gly His Trp Ala Thr Arg Thr Gln Thr Pro Tyr  
1940 1945 1950

Thr Asn Val Val Arg Ile Pro Asp Glu Met Gly Phe Pro Glu Ala  
1955 1960 1965

Ala Ser Val Pro Leu Ala Phe Thr Thr Ala Tyr Ile Ala Leu Tyr  
1970 1975 1980

Thr Thr Ala Lys Leu Arg Arg Gly Glu Arg Val Leu Ile His Ser  
1985 1990 1995

Gly Ala Gly Gly Val Gly Gln Ala Ala Ile Ile Leu Ser Gln Leu  
2000 2005 2010

Ala Gly Ala Glu Val Phe Val Thr Ala Gly Thr Gln Ala Lys Arg  
2015 2020 2025

Asp Phe Val Gly Asp Lys Phe Gly Ile Asn Pro Asp His Ile Phe  
2030 2035 2040

Ser Ser Arg Asn Asp Leu Phe Val Asp Gly Ile Lys Ala Tyr Thr  
2045 2050 2055

Gly Gly Leu Gly Val His Val Val Leu Asn Ser Leu Ala Gly Gln  
2060 2065 2070

Leu Leu Gln Ala Ser Phe Asp Cys Met Ala Glu Phe Gly Arg Phe  
2075 2080 2085

Val Glu Ile Gly Lys Lys Asp Leu Glu Gln Asn Ser Arg Leu Asp  
2090 2095 2100

Met Leu Pro Phe Thr Arg Asp Val Ser Phe Thr Ser Ile Asp Leu  
2105 2110 2115

Leu Ser Trp Gln Arg Ala Lys Ser Glu Glu Val Ser Glu Ala Leu  
2120 2125 2130

Asn His Val Thr Lys Leu Leu Glu Thr Lys Ala Ile Gly Leu Ile  
2135 2140 2145

Gly Pro Ile Gln Gln His Ser Leu Ser Asn Ile Glu Lys Ala Phe  
2150 2155 2160

Arg Thr Met Gln Ser Gly Gln His Val Gly Lys Val Val Val Asn  
2165 2170 2175

Val Ser Gly Asp Glu Leu Val Pro Val Gly Asp Gly Gly Phe Ser  
2180 2185 2190

Leu Lys Leu Lys Pro Asp Ser Ser Tyr Leu Val Ala Gly Gly Leu  
2195 2200 2205

Gly Gly Ile Gly Lys Gln Ile Cys Gln Trp Leu Val Asp His Gly  
2210 2215 2220

Ala Lys His Leu Ile Ile Leu Ser Arg Ser Ala Lys Ala Ser Pro  
2225 2230 2235

Phe Ile Thr Ser Leu Gln Asn Gln Gln Cys Ala Val Tyr Leu His  
2240 2245 2250

Ala Cys Asp Ile Ser Asp Gln Asp Gln Val Thr Lys Val Leu Arg  
2255 2260 2265

Leu Cys Glu Glu Ala His Ala Pro Pro Ile Arg Gly Ile Ile Gln  
2270 2275 2280

Gly Ala Met Val Leu Lys Asp Ala Leu Leu Ser Arg Met Thr Leu  
2285 2290 2295

Asp Glu Phe Asn Ala Ala Thr Arg Pro Lys Val Gln Gly Ser Trp  
2300 2305 2310

Tyr Leu His Lys Ile Ala Gln Asp Val Asp Phe Phe Val Met Leu  
2315 2320 2325

Ser Ser Leu Val Gly Val Met Gly Gly Ala Gly Gln Ala Asn Tyr  
2330 2335 2340

Ala Ala Ala Gly Ala Phe Gln Asp Ala Leu Ala His His Arg Arg  
2345 2350 2355

Ala His Gly Met Pro Ala Val Thr Ile Asp Leu Gly Met Val Lys  
2360 2365 2370

Ser Val Gly Tyr Val Ala Glu Thr Gly Arg Gly Val Ala Asp Arg  
2375 2380 2385

Leu Ala Arg Ile Gly Tyr Lys Pro Met His Glu Lys Asp Val Met  
2390 2395 2400

Asp Val Leu Glu Lys Ala Ile Leu Cys Ser Ser Pro Gln Phe Pro  
2405 2410 2415

Ser Pro Pro Ala Ala Val Val Thr Gly Ile Asn Thr Ser Pro Gly  
2420 2425 2430

Ala His Trp Thr Glu Ala Asn Trp Ile Gln Glu Gln Arg Phe Val  
2435 2440 2445

Gly Leu Lys Tyr Arg Gln Val Leu His Ala Asp Gln Ser Phe Val  
2450 2455 2460

Ser Ser His Lys Lys Gly Pro Asp Gly Val Arg Ala Gln Leu Ser  
2465 2470 2475

Arg Val Thr Ser His Asp Glu Ala Ile Ser Ile Val Leu Lys Ala  
2480 2485 2490

Met Thr Glu Lys Leu Met Arg Met Phe Gly Leu Ala Glu Asp Asp  
2495 2500 2505

Met Ser Ser Ser Lys Asn Leu Ala Gly Val Gly Val Asp Ser Leu  
2510 2515 2520

Val Ala Ile Glu Leu Arg Asn Trp Ile Thr Ser Glu Ile His Val  
2525 2530 2535

Asp Val Ser Ile Phe Glu Leu Met Asn Gly Asn Thr Ile Ala Gly  
2540 2545 2550

Leu Val Glu Leu Val Val Ala Lys Cys Ser  
2555 2560

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<212> DNA  
<213> *Penicillium citrinum*

<220>  
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Met Leu Gly Gln Val Leu Leu Thr Val Glu Ser Tyr Gln Trp Val Ser  
1 5 10 15  
  
acc cct caa gcc ctt gtg gcg gtc gca gtg ctt ctt agt ctc atc gcc 96  
Thr Pro Gln Ala Leu Val Ala Val Ala Val Leu Leu Ser Leu Ile Ala  
20 25 30  
  
tac cgt ttg cgg ggg cgc cag tcc gaa ctg caa gtc tat aat ccc aaa 144  
Tyr Arg Leu Arg Gly Arg Gln Ser Glu Leu Gln Val Tyr Asn Pro Lys  
35 40 45  
  
aaa tgg tgg gag ttg acg acc atg agg gct agg cag gac ttc gat acg 192  
Lys Trp Trp Glu Leu Thr Thr Met Arg Ala Arg Gln Asp Phe Asp Thr  
50 55 60  
  
tat ggt ccg agc tgg atc gaa gct tgg ttc tcg aaa aac gac aag ccc 240

Tyr	Gly	Pro	Ser	Trp	Ile	Glu	Ala	Trp	Phe	Ser	Lys	Asn	Asp	Lys	Pro	
65				70				75			80					
ctg	cgc	ttc	att	gtt	gat	tcc	ggc	tat	tgc	acc	atc	ctc	cca	tcg	tcc	288
Leu	Arg	Phe	Ile	Val	Asp	Ser	Gly	Tyr	Cys	Thr	Ile	Leu	Pro	Ser	Ser	
			85					90			95					
atg	gcc	gac	gag	ttt	cgg	aaa	atc	aaa	gat	atg	tgc	atg	tac	aag	ttt	336
Met	Ala	Asp	Glu	Phe	Arg	Lys	Ile	Lys	Asp	Met	Cys	Met	Tyr	Lys	Phe	
			100				105			110						
ttg	gcg	gat	gac	ttt	cac	tct	cat	ctc	cct	gga	ttc	gac	ggg	ttc	aag	384
Leu	Ala	Asp	Asp	Phe	His	Ser	His	Leu	Pro	Gly	Phe	Asp	Gly	Phe	Lys	
			115				120			125						
gaa	atc	tgc	cag	gat	gca	cat	ctt	gtc	aac	aaa	gtt	gtt	ttg	aac	cag	432
Glu	Ile	Cys	Gln	Asp	Ala	His	Leu	Val	Asn	Lys	Val	Val	Leu	Asn	Gln	
			130				135			140						
tta	caa	acc	caa	gcc	ccc	aag	tac	aca	aag	cca	ttg	gct	acc	ttg	gcc	480
Leu	Gln	Thr	Gln	Ala	Pro	Lys	Tyr	Thr	Lys	Pro	Leu	Ala	Thr	Leu	Ala	
			145				150			155			160			
gac	gct	act	att	gcc	aag	ttg	ttc	ggt	aaa	agc	gag	gag	tgg	caa	acc	528
Asp	Ala	Thr	Ile	Ala	Lys	Leu	Phe	Gly	Lys	Ser	Glu	Glu	Trp	Gln	Thr	
			165				170			175						
gca	cct	gtc	tat	tcc	aat	gga	ttg	gac	ctt	gtc	aca	cga	aca	gtc	aca	576
Ala	Pro	Val	Tyr	Ser	Asn	Gly	Leu	Asp	Leu	Val	Thr	Arg	Thr	Val	Thr	
			180				185			190						
ctc	att	atg	gtc	ggc	gac	aaa	atc	tgc	cac	aat	gag	gag	tgg	ctg	gat	624
Leu	Ile	Met	Val	Gly	Asp	Lys	Ile	Cys	His	Asn	Glu	Glu	Trp	Leu	Asp	
			195				200			205						
att	gca	aag	aac	cat	gcc	gtg	agt	gtg	gcg	gta	caa	gct	cgc	caa	ctt	672

Ile Ala Lys Asn His Ala Val Ser Val Ala Val Gln Ala Arg Gln Leu  
 210                    215                    220

cgc gta tgg ccc atg cta ctg cga ccg ctc gct cac tgg ttt caa ccg      720  
 Arg Val Trp Pro Met Leu Leu Arg Pro Leu Ala His Trp Phe Gln Pro  
 225                    230                    235                    240

caa gga cgc aaa ttg cgt gac caa gtg cgc cgc gca cga aag atc att      768  
 Gln Gly Arg Lys Leu Arg Asp Gln Val Arg Arg Ala Arg Lys Ile Ile  
 245                    250                    255

gat cct gag att cag cga cga cgt gct gaa aag gcc gca tgt gta gcg      816  
 Asp Pro Glu Ile Gln Arg Arg Arg Ala Glu Lys Ala Ala Cys Val Ala  
 260                    265                    270

aag ggc gtg cag ccg ccc cag tac gtc gat acc atg caa tgg ttt gaa      864  
 Lys Gly Val Gln Pro Pro Gln Tyr Val Asp Thr Met Gln Trp Phe Glu  
 275                    280                    285

gac acc gcc gac ggc cgc tgg tac gat gtg gcg ggt gct cag ctc gct      912  
 Asp Thr Ala Asp Gly Arg Trp Tyr Asp Val Ala Gly Ala Gln Leu Ala  
 290                    295                    300

atg gat ttc gcc ggc atc tac gcc tcg acg gat ctt ttc gtc ggt gcc      960  
 Met Asp Phe Ala Gly Ile Tyr Ala Ser Thr Asp Leu Phe Val Gly Ala  
 305                    310                    315                    320

ctt gtg gac att gcc agg cac cca gac ctt att cag cct ctc cgc caa      1008  
 Leu Val Asp Ile Ala Arg His Pro Asp Leu Ile Gln Pro Leu Arg Gln  
 325                    330                    335

gag atc cgc act gta atc gga gaa ggg ggc tgg acg cct gcc tct ctg      1056  
 Glu Ile Arg Thr Val Ile Gly Glu Gly Gly Trp Thr Pro Ala Ser Leu  
 340                    345                    350

ttc aag ctg aag ctc ctc gac agc tgc atg aaa gag acg cag cga atc      1104

Phe Lys Leu Lys Leu Leu Asp Ser Cys Met Lys Glu Thr Gln Arg Ile			
355	360	365	
aag ccg gtc gag tgc gcc act atg cgc agt acc gct ctc aga gac atc			1152
Lys Pro Val Glu Cys Ala Thr Met Arg Ser Thr Ala Leu Arg Asp Ile			
370	375	380	
act cta tcc aat ggc ctc ttc att ccc aag ggc gag ttg gcc gct gtg			1200
Thr Leu Ser Asn Gly Leu Phe Ile Pro Lys Gly Glu Leu Ala Ala Val			
385	390	395	400
gct gca gac cgc atg aac aac cct gat gtg tgg gaa aac ccc gaa aat			1248
Ala Ala Asp Arg Met Asn Asn Pro Asp Val Trp Glu Asn Pro Glu Asn			
405	410	415	
tat gat ccc tac cga ttt atg cgc atg cgc gag gat cca gac aag gcc			1296
Tyr Asp Pro Tyr Arg Phe Met Arg Met Arg Glu Asp Pro Asp Lys Ala			
420	425	430	
ttc acc gct caa ttg gag aat acc aac ggt gat cac atc ggc ttc ggc			1344
Phe Thr Ala Gln Leu Glu Asn Thr Asn Gly Asp His Ile Gly Phe Gly			
435	440	445	
tgg aac cca cgc gct tgt ccc ggg cgg ttc ttc gcc tcg aag gaa atc			1392
Trp Asn Pro Arg Ala Cys Pro Gly Arg Phe Phe Ala Ser Lys Glu Ile			
450	455	460	
aag att ctc ctc gct cat ata ctg att cag tat gat gtg aag cct gta			1440
Lys Ile Leu Leu Ala His Ile Leu Ile Gln Tyr Asp Val Lys Pro Val			
465	470	475	480
cca gga gac gat gac aaa tac tac cgt cac gct ttt agc gtt cgt atg			1488
Pro Gly Asp Asp Asp Lys Tyr Tyr Arg His Ala Phe Ser Val Arg Met			
485	490	495	
cat cca acc aca aag ctc atg gta cgc cgg cgc aac gag gac atc ccg			1536

His Pro Thr Thr Lys Leu Met Val Arg Arg Arg Asn Glu Asp Ile Pro  
500 505 510

ctc cct cat gac cgg tgc taa 1557  
Leu Pro His Asp Arg Cys  
515

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<211> 518  
<212> PRT  
<213> *Penicillium citrinum*

<400> 48

Met Leu Gly Gln Val Leu Leu Thr Val Glu Ser Tyr Gln Trp Val Ser  
1 5 10 15

Thr Pro Gln Ala Leu Val Ala Val Ala Val Leu Leu Ser Leu Ile Ala  
20 25 30

Tyr Arg Leu Arg Gly Arg Gln Ser Glu Leu Gln Val Tyr Asn Pro Lys  
35 40 45

Lys Trp Trp Glu Leu Thr Thr Met Arg Ala Arg Gln Asp Phe Asp Thr  
50 55 60

Tyr Gly Pro Ser Trp Ile Glu Ala Trp Phe Ser Lys Asn Asp Lys Pro  
65 70 75 80

Leu Arg Phe Ile Val Asp Ser Gly Tyr Cys Thr Ile Leu Pro Ser Ser

85

90

95

Met Ala Asp Glu Phe Arg Lys Ile Lys Asp Met Cys Met Tyr Lys Phe  
100 105 110

Leu Ala Asp Asp Phe His Ser His Leu Pro Gly Phe Asp Gly Phe Lys  
115 120 125

Glu Ile Cys Gln Asp Ala His Leu Val Asn Lys Val Val Leu Asn Gln  
130 135 140

Leu Gln Thr Gln Ala Pro Lys Tyr Thr Lys Pro Leu Ala Thr Leu Ala  
145 150 155 160

Asp Ala Thr Ile Ala Lys Leu Phe Gly Lys Ser Glu Glu Trp Gln Thr  
165 170 175

Ala Pro Val Tyr Ser Asn Gly Leu Asp Leu Val Thr Arg Thr Val Thr  
180 185 190

Leu Ile Met Val Gly Asp Lys Ile Cys His Asn Glu Glu Trp Leu Asp  
195 200 205

Ile Ala Lys Asn His Ala Val Ser Val Ala Val Gln Ala Arg Gln Leu  
210 215 220

Arg Val Trp Pro Met Leu Leu Arg Pro Leu Ala His Trp Phe Gln Pro

225                    230                    235                    240

Gln Gly Arg Lys Leu Arg Asp Gln Val Arg Arg Ala Arg Lys Ile Ile  
245                    250                    255

Asp Pro Glu Ile Gln Arg Arg Arg Ala Glu Lys Ala Ala Cys Val Ala  
260                    265                    270

Lys Gly Val Gln Pro Pro Gln Tyr Val Asp Thr Met Gln Trp Phe Glu  
275                    280                    285

Asp Thr Ala Asp Gly Arg Trp Tyr Asp Val Ala Gly Ala Gln Leu Ala  
290                    295                    300

Met Asp Phe Ala Gly Ile Tyr Ala Ser Thr Asp Leu Phe Val Gly Ala  
305                    310                    315                    320

Leu Val Asp Ile Ala Arg His Pro Asp Leu Ile Gln Pro Leu Arg Gln  
325                    330                    335

Glu Ile Arg Thr Val Ile Gly Glu Gly Gly Trp Thr Pro Ala Ser Leu  
340                    345                    350

Phe Lys Leu Lys Leu Leu Asp Ser Cys Met Lys Glu Thr Gln Arg Ile  
355                    360                    365

Lys Pro Val Glu Cys Ala Thr Met Arg Ser Thr Ala Leu Arg Asp Ile

370                   375                   380

Thr Leu Ser Asn Gly Leu Phe Ile Pro Lys Gly Glu Leu Ala Ala Val  
385                   390                   395                   400

Ala Ala Asp Arg Met Asn Asn Pro Asp Val Trp Glu Asn Pro Glu Asn  
405                   410                   415

Tyr Asp Pro Tyr Arg Phe Met Arg Met Arg Glu Asp Pro Asp Lys Ala  
420                   425                   430

Phe Thr Ala Gln Leu Glu Asn Thr Asn Gly Asp His Ile Gly Phe Gly  
435                   440                   445

Trp Asn Pro Arg Ala Cys Pro Gly Arg Phe Phe Ala Ser Lys Glu Ile  
450                   455                   460

Lys Ile Leu Leu Ala His Ile Leu Ile Gln Tyr Asp Val Lys Pro Val  
465                   470                   475                   480

Pro Gly Asp Asp Asp Lys Tyr Tyr Arg His Ala Phe Ser Val Arg Met  
485                   490                   495

His Pro Thr Thr Lys Leu Met Val Arg Arg Asn Glu Asp Ile Pro  
500                   505                   510

Leu Pro His Asp Arg Cys

<210> 49  
 <211> 3522  
 <212> DNA  
 <213> *Penicillium citrinum*

<220>  
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<400> 49				
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Met Val Ala Ser Leu Leu Pro Ser Arg Phe Arg Gly Arg Glu Ser Met				
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aat cag cag cac cct cta cgc tcg gga aat cgg gca ttg acc tcc aca				96
Asn Gln Gln His Pro Leu Arg Ser Gly Asn Arg Ala Leu Thr Ser Thr				
20	25	30		
ctc caa ttt cta tcc aaa acg gcg tgt cta cac ccg atc cat acc gtt				144
Leu Gln Phe Leu Ser Lys Thr Ala Cys Leu His Pro Ile His Thr Val				
35	40	45		
tgc acc ata gct att cta gct agt acc aca tac gtt gga cta ctc aaa				192
Cys Thr Ile Ala Ile Leu Ala Ser Thr Thr Tyr Val Gly Leu Leu Lys				
50	55	60		
gac agc ttc ttc cat ggc ccc gca aac gtt gat aaa gca gaa tgg ggc				240
Asp Ser Phe Phe His Gly Pro Ala Asn Val Asp Lys Ala Glu Trp Gly				
65	70	75	80	
tct ttg gtc gaa gga agt cga agc ttg atc acc ggc cca cag aat ggc				288
Ser Leu Val Glu Gly Ser Arg Ser Leu Ile Thr Gly Pro Gln Asn Gly				
85	90	95		

tgg aag tgg cag agc ttc gac ggg gat gca gat gtt ctc gga gat ttc			336
Trp Lys Trp Gln Ser Phe Asp Gly Asp Ala Asp Val Leu Gly Asp Phe			
100	105	110	
aac cat caa gca cta atg acc ttg gta ttc ccg ggg tca tat ggg gtt			384
Asn His Gln Ala Leu Met Thr Leu Val Phe Pro Gly Ser Tyr Gly Val			
115	120	125	
gca tct caa gca gcc tca cca ttc ctt gct ccc ctc cct gtg aac cta			432
Ala Ser Gln Ala Ala Ser Pro Phe Leu Ala Pro Leu Pro Val Asn Leu			
130	135	140	
tct gtg att gac ctt ccc tca acg tcg agc cct tta acc gcc tat tcg			480
Ser Val Ile Asp Leu Pro Ser Thr Ser Ser Pro Leu Thr Ala Tyr Ser			
145	150	155	160
aaa gat aaa gtt ttc gcc ttc tct gtg gaa tac agc agc gcg ccg gaa			528
Lys Asp Lys Val Phe Ala Phe Ser Val Glu Tyr Ser Ser Ala Pro Glu			
165	170	175	
ctc gtg gct gct gtt caa gaa atc ccc aac aac agt gcc gac ctg aaa			576
Leu Val Ala Ala Val Gln Glu Ile Pro Asn Asn Ser Ala Asp Leu Lys			
180	185	190	
ttg cag gag acg caa ttg atc gag atg gaa cgc cag atg tgg atc atg			624
Leu Gln Glu Thr Gln Leu Ile Glu Met Glu Arg Gln Met Trp Ile Met			
195	200	205	
aag gct gcc agg gct cac aca aaa cgc agc ctt gct caa tgg gtg cac			672
Lys Ala Ala Arg Ala His Thr Lys Arg Ser Leu Ala Gln Trp Val His			
210	215	220	
gat acc tgg aca gag tct ctt gat ctt atc aag agc gct caa acg ctc			720
Asp Thr Trp Thr Glu Ser Leu Asp Leu Ile Lys Ser Ala Gln Thr Leu			
225	230	235	240

gac gtg gtt gtc atg gtg cta ggt tat ata tca atg cac ttg act ttc			768
Asp Val Val Val Met Val Leu Gly Tyr Ile Ser Met His Leu Thr Phe			
245	250	255	
gtc tca ctc ttc ctc agc atg aaa aaa ttg gga tcg aag gtt tgg ctg			816
Val Ser Leu Phe Leu Ser Met Lys Lys Leu Gly Ser Lys Val Trp Leu			
260	265	270	
gct aca agc gtc ctt ttg tcg tca aca ttt gcc ttt ctc ctc ggt ctc			864
Ala Thr Ser Val Leu Leu Ser Ser Thr Phe Ala Phe Leu Leu Gly Leu			
275	280	285	
gac gtg gcc ata aga cta ggg gtt ccg atg agc atg agg ttg cta tcc			912
Asp Val Ala Ile Arg Leu Gly Val Pro Met Ser Met Arg Leu Leu Ser			
290	295	300	
gaa ggc ctc ccc ttc ttg gtg gtg atc gtt ggc ttt gag aag agc atc			960
Glu Gly Leu Pro Phe Leu Val Val Ile Val Gly Phe Glu Lys Ser Ile			
305	310	315	320
act ctg acc agg gct gtt ttg tcc tat gct gtg cag cac cga aag ccc			1008
Thr Leu Thr Arg Ala Val Leu Ser Tyr Ala Val Gln His Arg Lys Pro			
325	330	335	
cag aag ata cag tct gac cag ggt agc gtg aca gcc att gct gaa agt			1056
Gln Lys Ile Gln Ser Asp Gln Gly Ser Val Thr Ala Ile Ala Glu Ser			
340	345	350	
acc atc aat tac gcc gta cga agc gcc att cgg gag aag ggt tac aat			1104
Thr Ile Asn Tyr Ala Val Arg Ser Ala Ile Arg Glu Lys Gly Tyr Asn			
355	360	365	
atc gtg tgc cac tac gtg gtc gag atc ctg ctc cta gtt atc ggt gct			1152
Ile Val Cys His Tyr Val Val Glu Ile Leu Leu Val Ile Gly Ala			
370	375	380	

gtc tta ggc atc caa ggt ggg cta cag cac ttc tgt gtt cta gct gca			1200
Val Leu Gly Ile Gln Gly Gly Leu Gln His Phe Cys Val Leu Ala Ala			
385	390	395	400
ttg atc ctg ttc ttt gac tgt ctg ctg ttt aca ttc tac act gcg			1248
Leu Ile Leu Phe Phe Asp Cys Leu Leu Leu Phe Thr Phe Tyr Thr Ala			
405	410	415	
att ctg tct atc aag ctc gag gta aac cgc ctc aaa cgt cat atc aac			1296
Ile Leu Ser Ile Lys Leu Glu Val Asn Arg Leu Lys Arg His Ile Asn			
420	425	430	
atg cgg tac gcg ttg gaa gat gag ggt ctc agt cag cgg acg gcg gag			1344
Met Arg Tyr Ala Leu Glu Asp Glu Gly Leu Ser Gln Arg Thr Ala Glu			
435	440	445	
agt gtc gcg acc agc aat gat gcc caa gac agt gca cgt aca tat ctg			1392
Ser Val Ala Thr Ser Asn Asp Ala Gln Asp Ser Ala Arg Thr Tyr Leu			
450	455	460	
ttt ggc aat gat atg aaa ggc agc agt gtt ccg aag ttc aaa ttc tgg			1440
Phe Gly Asn Asp Met Lys Gly Ser Ser Val Pro Lys Phe Lys Phe Trp			
465	470	475	480
atg gtc gtt ggt ttc ctt atc gtc aac ctc gtc aac atc ggc tcc acc			1488
Met Val Val Gly Phe Leu Ile Val Asn Leu Val Asn Ile Gly Ser Thr			
485	490	495	
ctt ttc caa gcc tct tci agt gga tcg ttg tcc agt ata tca tct tgg			1536
Leu Phe Gln Ala Ser Ser Ser Gly Ser Leu Ser Ser Ile Ser Ser Trp			
500	505	510	
acc gaa agt ctg agc gga tcg gcc att aaa ccc ccc ctt gag ccc ttc			1584
Thr Glu Ser Leu Ser Gly Ser Ala Ile Lys Pro Pro Leu Glu Pro Phe			
515	520	525	

aag gta gct gga agt gga cta gat gaa cta ctt ttc cag gca aga ggg Lys Val Ala Gly Ser Gly Leu Asp Glu Leu Leu Phe Gln Ala Arg Gly	530	535	540	1632
cgc ggt caa tcg act atg gtc act gtc ctc gcc ccc atc aag tac gaa Arg Gly Gln Ser Thr Met Val Thr Val Leu Ala Pro Ile Lys Tyr Glu	545	550	555	1680
cta gag tat cct tcc att cac cgt ggt acc tcg cag cta cac gag tat Leu Glu Tyr Pro Ser Ile His Arg Gly Thr Ser Gln Leu His Glu Tyr	565	570	575	1728
gga gtt ggt gga aaa atg gtc ggt agc ctg ctc acc agc ctg gaa gat Gly Val Gly Gly Lys Met Val Gly Ser Leu Leu Thr Ser Leu Glu Asp	580	585	590	1776
ccc gtc ctc tcc aaa tgg gtg ttt gtg gca ctt gcc cta agt gtc gct Pro Val Leu Ser Lys Trp Val Phe Val Ala Leu Ala Leu Ser Val Ala	595	600	605	1824
ctg aac agc tat ctg ttc aag gcc gca aga ctg gga atc aaa gat cct Leu Asn Ser Tyr Leu Phe Lys Ala Ala Arg Leu Gly Ile Lys Asp Pro	610	615	620	1872
aat ctc ccg agt cac cca gtt gat cca gtt gag ctt gac cag gcc gaa Asn Leu Pro Ser His Pro Val Asp Pro Val Glu Leu Asp Gln Ala Glu	625	630	635	1920
agc ttc aac gct gcc cag aac cag acc cct cag att caa tca agt ctc Ser Phe Asn Ala Ala Gln Asn Gln Thr Pro Gln Ile Gln Ser Ser Leu	645	650	655	1968
caa gct cct cag acc aga gtg ttc act cct acc acc acc gac agt gac Gln Ala Pro Gln Thr Arg Val Phe Thr Pro Thr Thr Asp Ser Asp	660	665	670	2016

agt gat gcc tca tta gtc tta att aaa gca tct cta aag gtc act aag			2064
Ser Asp Ala Ser Leu Val Leu Ile Lys Ala Ser Leu Lys Val Thr Lys			
675	680	685	
cga gca gaa gga aag aca gcc act agt gaa ctt ccc gtg tct cgc aca			2112
Arg Ala Glu Gly Lys Thr Ala Thr Ser Glu Leu Pro Val Ser Arg Thr			
690	695	700	
caa atc gaa ctg gac aat ttg ctg aag cag aac aca atc agc gag ttg			2160
Gln Ile Glu Leu Asp Asn Leu Leu Lys Gln Asn Thr Ile Ser Glu Leu			
705	710	715	720
aac gat gag gat gtc gtt gcc ttg tct ttg cgg gga aag gtt ccc ggg			2208
Asn Asp Glu Asp Val Val Ala Leu Ser Leu Arg Gly Lys Val Pro Gly			
725	730	735	
tat gcc cta gag aag agt ctc aaa gac tgc act cgt gcc gtc aag gtt			2256
Tyr Ala Leu Glu Lys Ser Leu Lys Asp Cys Thr Arg Ala Val Lys Val			
740	745	750	
cgc cgc tct atc att tcg agg aca ccg gct acc gca gag ctt aca agt			2304
Arg Arg Ser Ile Ile Ser Arg Thr Pro Ala Thr Ala Glu Leu Thr Ser			
755	760	765	
atg ctg gag cac tcg aag ctg ccg tac gaa aac tac gcc tgg gaa cgc			2352
Met Leu Glu His Ser Lys Leu Pro Tyr Glu Asn Tyr Ala Trp Glu Arg			
770	775	780	
gtg ctc ggt gca tgt tgc gag aac gtt att ggc tat atg cca gtc cct			2400
Val Leu Gly Ala Cys Cys Glu Asn Val Ile Gly Tyr Met Pro Val Pro			
785	790	795	800
gtt ggc gtc gcc ggt cct att gtt atc gac ggc aag agt tat ttc att			2448
Val Gly Val Ala Gly Pro Ile Val Ile Asp Gly Lys Ser Tyr Phe Ile			
805	810	815	

cct atg gca acc acc gag ggc gtc ctc gtc gct agt gct agc cgt ggc Pro Met Ala Thr Thr Glu Gly Val Leu Val Ala Ser Ala Ser Arg Gly	820	825	830	2496	
agt aag gca atc aac ctc ggt ggc ggt gcc gtg aca gtc ctg act ggc Ser Lys Ala Ile Asn Leu Gly Gly Ala Val Thr Val Leu Thr Gly	835	840	845	2544	
gac ggt atg aca cga ggc ccg tgt gtg aag ttt gat gtc ctt gaa cga Asp Gly Met Thr Arg Gly Pro Cys Val Lys Phe Asp Val Leu Glu Arg	850	855	860	2592	
gct ggt gct gct aag atc tgg ctc gat tcg gac gtc ggc cag acc gta Ala Gly Ala Ala Lys Ile Trp Leu Asp Ser Asp Val Gly Gln Thr Val	865	870	875	880	2640
atg aaa gaa gcc ttc aat tca acc agc aga tti gcg cgc tta caa agt Met Lys Glu Ala Phe Asn Ser Thr Ser Arg Phe Ala Arg Leu Gln Ser	885	890	895	2688	
atg cgg aca act atc gcc ggt act cac tta tat att cga ttt aag act Met Arg Thr Thr Ile Ala Gly Thr His Leu Tyr Ile Arg Phe Lys Thr	900	905	910	2736	
act act ggc gac gct atg gga atg aat atg att tct aag ggc gtg gag Thr Thr Gly Asp Ala Met Gly Met Asn Met Ile Ser Lys Gly Val Glu	915	920	925	2784	
cat gca ctg aat gtt atg gcg aca gag gca ggt ttc agc gat atg aat His Ala Leu Asn Val Met Ala Thr Glu Ala Gly Phe Ser Asp Met Asn	930	935	940	2832	
att att acc cta tca gga aat tac tgt acg gat aag aaa cct tca gct Ile Ile Thr Leu Ser Gly Asn Tyr Cys Thr Asp Lys Lys Pro Ser Ala	945	950	955	960	2880

ttg aat tgg atc gat gga cgg ggc aag ggc att gtg gcc gaa gcc atc		2928
Leu Asn Trp Ile Asp Gly Arg Gly Lys Gly Ile Val Ala Glu Ala Ile		
965	970	975
ata ccg gcg aac gtt gtc agg gat gtc tta aag agc gat gtg gat agc		2976
Ile Pro Ala Asn Val Val Arg Asp Val Leu Lys Ser Asp Val Asp Ser		
980	985	990
atg gtt cag ctc aac ata tcg aaa aat ctg att ggg tcc gct atg gct		3024
Met Val Gln Leu Asn Ile Ser Lys Asn Leu Ile Gly Ser Ala Met Ala		
995	1000	1005
ggc tca gtt ggc ggc ttc aac gcc caa gct gcc aat ctt gcg gca		3069
Gly Ser Val Gly Gly Phe Asn Ala Gln Ala Ala Asn Leu Ala Ala		
1010	1015	1020
gcc att ttc att gcc aca ggt cag gat ccg gcg caa gtt gtg gag		3114
Ala Ile Phe Ile Ala Thr Gly Gln Asp Pro Ala Gln Val Val Glu		
1025	1030	1035
agc gct aac tgc atc act ctc atg aac aat ctt cgc gga tcg ctt		3159
Ser Ala Asn Cys Ile Thr Leu Met Asn Asn Leu Arg Gly Ser Leu		
1040	1045	1050
caa atc tct gtc tcc atg ccg tct att gag gtt gga acg ttg ggc		3204
Gln Ile Ser Val Ser Met Pro Ser Ile Glu Val Gly Thr Leu Gly		
1055	1060	1065
ggt ggt acg att ctg gag ccc cag ggc gca atg ctt gac atg ctt		3249
Gly Gly Thr Ile Leu Glu Pro Gln Gly Ala Met Leu Asp Met Leu		
1070	1075	1080
ggt gtc cgc gga tca cac ccg acc act ccc ggt gag aat gca cgt		3294
Gly Val Arg Gly Ser His Pro Thr Thr Pro Gly Glu Asn Ala Arg		
1085	1090	1095

caa ctt	gct gtc atc atc gga	agc gct gtt ttg gct	ggg gag ctc	3339
Gln Leu	Ala Arg Ile Ile Gly	Ser Ala Val Leu Ala	Gly Glu Leu	
1100	1105	1110		
tcg cta	tgt gct gcc cta gcc	gcc ggt cac ctg gtc	aag gcg cac	3384
Ser Leu	Cys Ala Ala Leu Ala	Ala Gly His Leu Val	Lys Ala His	
1115	1120	1125		
atg gcg	cac aac cgt tct gcc	ccg gca tct tca gcc	cct tct cga	3429
Met Ala	His Asn Arg Ser Ala	Pro Ala Ser Ser Ala	Pro Ser Arg	
1130	1135	1140		
agt gtc	tcc ccg tca ggc gga	acc agg aca gtc cct	gtt cct aac	3474
Ser Val	Ser Pro Ser Gly Gly	Thr Arg Thr Val Pro	Val Pro Asn	
1145	1150	1155		
aat gca	ctg agg ccg agt gct	gca gct act gat cgg	gct cga cgc	3519
Asn Ala	Leu Arg Pro Ser Ala	Ala Ala Thr Asp Arg	Ala Arg Arg	
1160	1165	1170		
tga				3522

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Asn Gln Gln His Pro Leu Arg Ser Gly Asn Arg Ala Leu Thr Ser Thr

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Leu Gln Phe Leu Ser Lys Thr Ala Cys Leu His Pro Ile His Thr Val  
35                    40                    45

Cys Thr Ile Ala Ile Leu Ala Ser Thr Thr Tyr Val Gly Leu Leu Lys  
50                    55                    60

Asp Ser Phe Phe His Gly Pro Ala Asn Val Asp Lys Ala Glu Trp Gly  
65                    70                    75                    80

Ser Leu Val Glu Gly Ser Arg Ser Leu Ile Thr Gly Pro Gln Asn Gly  
85                    90                    95

Trp Lys Trp Gln Ser Phe Asp Gly Asp Ala Asp Val Leu Gly Asp Phe  
100                  105                  110

Asn His Gln Ala Leu Met Thr Leu Val Phe Pro Gly Ser Tyr Gly Val  
115                  120                  125

Ala Ser Gln Ala Ala Ser Pro Phe Leu Ala Pro Leu Pro Val Asn Leu  
130                  135                  140

Ser Val Ile Asp Leu Pro Ser Thr Ser Ser Pro Leu Thr Ala Tyr Ser  
145                  150                  155                  160

Lys Asp Lys Val Phe Ala Phe Ser Val Glu Tyr Ser Ser Ala Pro Glu

165 170 175

Leu Val Ala Ala Val Gln Glu Ile Pro Asn Asn Ser Ala Asp Leu Lys  
180 185 190

Leu Gln Glu Thr Gln Leu Ile Glu Met Glu Arg Gln Met Trp Ile Met  
195 200 205

Lys Ala Ala Arg Ala His Thr Lys Arg Ser Leu Ala Gln Trp Val His  
210 215 220

Asp Thr Trp Thr Glu Ser Leu Asp Leu Ile Lys Ser Ala Gln Thr Leu  
225 230 235 240

Asp Val Val Val Met Val Leu Gly Tyr Ile Ser Met His Leu Thr Phe  
245 250 255

Val Ser Leu Phe Leu Ser Met Lys Lys Leu Gly Ser Lys Val Trp Leu  
260 265 270

Ala Thr Ser Val Leu Leu Ser Ser Thr Phe Ala Phe Leu Leu Gly Leu  
275 280 285

Asp Val Ala Ile Arg Leu Gly Val Pro Met Ser Met Arg Leu Leu Ser  
290 295 300

Glu Gly Leu Pro Phe Leu Val Val Ile Val Gly Phe Glu Lys Ser Ile

305                    310                    315                    320

Thr Leu Thr Arg Ala Val Leu Ser Tyr Ala Val Gln His Arg Lys Pro  
325                    330                    335

Gln Lys Ile Gln Ser Asp Gln Gly Ser Val Thr Ala Ile Ala Glu Ser  
340                    345                    350

Thr Ile Asn Tyr Ala Val Arg Ser Ala Ile Arg Glu Lys Gly Tyr Asn  
355                    360                    365

Ile Val Cys His Tyr Val Val Glu Ile Leu Leu Leu Val Ile Gly Ala  
370                    375                    380

Val Leu Gly Ile Gln Gly Gly Leu Gln His Phe Cys Val Leu Ala Ala  
385                    390                    395                    400

Leu Ile Leu Phe Phe Asp Cys Leu Leu Leu Phe Thr Phe Tyr Thr Ala  
405                    410                    415

Ile Leu Ser Ile Lys Leu Glu Val Asn Arg Leu Lys Arg His Ile Asn  
420                    425                    430

Met Arg Tyr Ala Leu Glu Asp Glu Gly Leu Ser Gln Arg Thr Ala Glu  
435                    440                    445

Ser Val Ala Thr Ser Asn Asp Ala Gln Asp Ser Ala Arg Thr Tyr Leu

450 455 460

Phe Gly Asn Asp Met Lys Gly Ser Ser Val Pro Lys Phe Lys Phe Trp  
465 470 475 480

Met Val Val Gly Phe Leu Ile Val Asn Leu Val Asn Ile Gly Ser Thr  
485 490 495

Leu Phe Gln Ala Ser Ser Ser Gly Ser Leu Ser Ser Ile Ser Ser Trp  
500 505 510

Thr Glu Ser Leu Ser Gly Ser Ala Ile Lys Pro Pro Leu Glu Pro Phe  
515 520 525

Lys Val Ala Gly Ser Gly Leu Asp Glu Leu Leu Phe Gln Ala Arg Gly  
530 535 540

Arg Gly Gln Ser Thr Met Val Thr Val Leu Ala Pro Ile Lys Tyr Glu  
545 550 555 560

Leu Glu Tyr Pro Ser Ile His Arg Gly Thr Ser Gln Leu His Glu Tyr  
565 570 575

Gly Val Gly Gly Lys Met Val Gly Ser Leu Leu Thr Ser Leu Glu Asp  
580 585 590

Pro Val Leu Ser Lys Trp Val Phe Val Ala Leu Ala Leu Ser Val Ala

595

600

605

Leu Asn Ser Tyr Leu Phe Lys Ala Ala Arg Leu Gly Ile Lys Asp Pro

610

615

620

Asn Leu Pro Ser His Pro Val Asp Pro Val Glu Leu Asp Gln Ala Glu

625

630

635

640

Ser Phe Asn Ala Ala Gln Asn Gln Thr Pro Gln Ile Gln Ser Ser Leu

645

650

655

Gln Ala Pro Gln Thr Arg Val Phe Thr Pro Thr Thr Asp Ser Asp

660

665

670

Ser Asp Ala Ser Leu Val Leu Ile Lys Ala Ser Leu Lys Val Thr Lys

675

680

685

Arg Ala Glu Gly Lys Thr Ala Thr Ser Glu Leu Pro Val Ser Arg Thr

690

695

700

Gln Ile Glu Leu Asp Asn Leu Leu Lys Gln Asn Thr Ile Ser Glu Leu

705

710

715

720

Asn Asp Glu Asp Val Val Ala Leu Ser Leu Arg Gly Lys Val Pro Gly.

725

730

735

Tyr Ala Leu Glu Lys Ser Leu Lys Asp Cys Thr Arg Ala Val Lys Val

740

745

750

Arg Arg Ser Ile Ile Ser Arg Thr Pro Ala Thr Ala Glu Leu Thr Ser  
755 760 765

Met Leu Glu His Ser Lys Leu Pro Tyr Glu Asn Tyr Ala Trp Glu Arg  
770 775 780

Val Leu Gly Ala Cys Cys Glu Asn Val Ile Gly Tyr Met Pro Val Pro  
785 790 795 800

/

Val Gly Val Ala Gly Pro Ile Val Ile Asp Gly Lys Ser Tyr Phe Ile  
805 810 815

Pro Met Ala Thr Thr Glu Gly Val Leu Val Ala Ser Ala Ser Arg Gly  
820 825 830

Ser Lys Ala Ile Asn Leu Gly Gly Gly Ala Val Thr Val Leu Thr Gly  
835 840 845

Asp Gly Met Thr Arg Gly Pro Cys Val Lys Phe Asp Val Leu Glu Arg  
850 855 860

Ala Gly Ala Ala Lys Ile Trp Leu Asp Ser Asp Val Gly Gln Thr Val  
865 870 875 880

Met Lys Glu Ala Phe Asn Ser Thr Ser Arg Phe Ala Arg Leu Gln Ser

885                    890                    895

Met Arg Thr Thr Ile Ala Gly Thr His Leu Tyr Ile Arg Phe Lys Thr  
900                    905                    910

Thr Thr Gly Asp Ala Met Gly Met Asn Met Ile Ser Lys Gly Val Glu  
915                    920                    925

His Ala Leu Asn Val Met Ala Thr Glu Ala Gly Phe Ser Asp Met Asn  
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Ile Ile Thr Leu Ser Gly Asn Tyr Cys Thr Asp Lys Lys Pro Ser Ala  
945                    950                    955                    960

Leu Asn Trp Ile Asp Gly Arg Gly Lys Gly Ile Val Ala Glu Ala Ile  
965                    970                    975

Ile Pro Ala Asn Val Val Arg Asp Val Leu Lys Ser Asp Val Asp Ser  
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Met Val Gln Leu Asn Ile Ser Lys Asn Leu Ile Gly Ser Ala Met Ala  
995                    1000                    1005

Gly Ser Val Gly Gly Phe Asn Ala Gln Ala Ala Asn Leu Ala Ala  
1010                    1015                    1020

Ala Ile Phe Ile Ala Thr Gly Gln Asp Pro Ala Gln Val Val Glu

1025                  1030                  1035

Ser Ala Asn Cys Ile Thr Leu Met Asn Asn Leu Arg Gly Ser Leu  
1040                  1045                  1050

Gln Ile Ser Val Ser Met Pro Ser Ile Glu Val Gly Thr Leu Gly  
1055                  1060                  1065

Gly Gly Thr Ile Leu Glu Pro Gln Gly Ala Met Leu Asp Met Leu  
1070                  1075                  1080

Gly Val Arg Gly Ser His Pro Thr Thr Pro Gly Glu Asn Ala Arg  
1085                  1090                  1095

Gln Leu Ala Arg Ile Ile Gly Ser Ala Val Leu Ala Gly Glu Leu  
1100                  1105                  1110

Ser Leu Cys Ala Ala Leu Ala Ala Gly His Leu Val Lys Ala His  
1115                  1120                  1125

Met Ala His Asn Arg Ser Ala Pro Ala Ser Ser Ala Pro Ser Arg  
1130                  1135                  1140

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